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CENTER FOR LABOR MARKET STUDIES

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# Massachusetts Occupational Outlook

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Commonwealth of Massachusetts, Michael S. Dukakis, Governor

902/62



This publication on selected career opportunities in Massachusetts was produced under the auspices of the Massachusetts Occupational Information Coordinating Committee (MOICC). The committee members include Mr. Elmer Bartels, Commissioner of Rehabilitation; Dr. David Cronin, Associate Commissioner, Division of Occupational Education; and Mr. James French, Commissioner of the Department of Employment and Training. Working together, these individuals coordinate the development and dissemination of labor market and occupational information for planning and administering education, training, counseling, career development, and job placement activities throughout the Commonwealth.

# Massachusetts Occupational Outlook

A Guide to Selected Opportunities  
in the Massachusetts Economy

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May 1989

## Foreword

Information about employment prospects in alternative career fields is essential for job seekers and those making educational and career decisions. Fundamental changes in the job content of the Massachusetts economy have altered the landscape of opportunities available to individuals in labor market transition. Students, parents, teachers, and counselors need to know about tomorrow's job prospects as they make important educational and career decisions. The Massachusetts Department of Employment and Training recognizes the importance of information about the current and future job skill requirements of Massachusetts employers in the career decision-making process. *Massachusetts Occupational Outlook* represents our continued commitment to provide up-to-date career information to career decision-makers and their counselors and advisors.

James F. French  
Commissioner  
Massachusetts Department of Employment and Training

## Acknowledgments

This volume was produced with the help of many individuals. Commissioner James French and Associate Commissioner Richard Sullivan of the Department of Employment and Training (DET) provided overall guidance and support for this project. Ann Coles, Thomas Fallon, John McDonagh, and J.P. Moriarty, as members of the Massachusetts Occupational Information Coordinating Committee's Technical Advisory Group, have long encouraged the development and wide dissemination of career information such as the *Outlook*.

Special thanks are due to Bernard Burns, Frank Cahill, Gerald Fahey, and Edward Kaznocha of the Field Research Staff of DET for providing some key labor market information. Occupational employment projections were prepared by Catherine Foley and Mary-Ellen Steller of the Occupation-Industry research unit of DET under the direction of Elliot Winer. Ann Coles and her staff at the Higher Education Information Center located at the Boston Public Library were especially helpful. Ms. Cole's willingness to share her information sources substantially contributed to the usefulness of the material included in this volume.

Finally, I would like to express my personal thanks to Marlene Seltzer, former Commissioner of DET, and Andrew Sum, Director of the Center for Labor Market Studies of Northeastern University, for their long-time support of our efforts in the development and dissemination of high quality career information products.

Robert Vinson  
Executive Director, MOICC



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## Introduction

This is the fourth publication in a series produced by the Department of Employment and Training in cooperation with the Massachusetts Occupational Information Coordinating Committee and the Center for Labor Market Studies of Northeastern University. The purpose of the series is to improve the quality of occupational information available to career guidance and vocational counselors and job development and placement professionals in the state. The *Outlook*, along with *The Job Guide for Human Resource, Counseling, and Placement Professionals (Volumes 1-3)*, *High Technology Careers in Massachusetts*, and *Career Choice in a Changing Economy*, use statistical data and other timely information about Massachusetts industries and occupations to provide career counselors and others with a better understanding of employment alternatives in the state economy. Together, these volumes are an invaluable source of labor market information -- the nature and location of today's jobs and the education and training they require. The series offers planners, counselors, and job developers a systematic approach for improving career and vocational services for students and adults.

Three key concepts underlie the development of the series:

- First, each publication uses *industries* as the primary frame of reference for researching occupations. This emphasis is based on the principle that individual industry performance determines the number, kind, and distribution of occupational opportunities. Stated simply, *industries drive jobs*. Improving our understanding of the industries that make up the Massachusetts economy and the ways to use available data on occupational staffing patterns is the first step toward better educational and career decision-making.

- Second, each publication stresses the importance of education in the Massachusetts economy of the eighties and nineties. Two of them, *High Technology Careers* and *Massachusetts Occupational Outlook*, contain important information about the level of education and training required to enter particular occupations. Changes in the relative employment performance and occupational composition of individual industries have had a profound effect on the levels of education, training, and experience required of the workforce. This series of publications reflects the critical role of education and training on occupational attainment and earnings in the new Massachusetts economy. Both the *Outlook* and *High Technology Careers* describe the education and skill requirements of individual occupations and provide contact information for institutions offering relevant educational and vocational preparation programs in Massachusetts.

- Third, each publication utilizes the Standard Industrial Classification (SIC) system to classify industry data and to locate occupations. Virtually all data bases on industry employment at the federal, state, and local levels are organized according to this system, and a guide to using it is included in Appendix A.

## **How This Publication Is Organized**

The *Massachusetts Occupational Outlook* is the first comprehensive state-specific guide to occupations and industries specifically developed for career counselors, vocational educators, job developers, and placement professionals. A practical guide to the dynamic Massachusetts job market, the *Outlook* contains the most up-to-date information on occupational employment trends, entry requirements, and job content available of any state publication. The authors have attempted to bring the occupations to life, to tell the story of some of the most promising jobs in the Massachusetts economy, and to highlight the importance of occupational training and postsecondary education in securing those jobs. The *Outlook* emphasizes that, in the coming decade, educational attainment and occupational skills will be essential if we are to ensure prosperity for all Massachusetts citizens.

The *Outlook* contains detailed descriptions of important occupations in the Massachusetts economy today. The occupations are discussed in the context of industry job growth. Occupations tend to span several industries and individual industries perform differently in a dynamic economy; thus, an industry-based approach is useful in three ways: it allows us to track the performance of various segments of the state economy, to uncover the most likely sources of employment opportunity, and to analyze the relative proportion of high-, middle-, and low-skilled jobs within specific industry groups to see how the composition of employment has changed over time.

Each occupation included in the *Outlook* contains information about the content, availability, working conditions, career mobility, salary, and education and training requirements associated with the job, along with sources for further research. Also included are listings of the educational institutions providing the training for these occupations within Massachusetts. For those occupations for which training is available in the state's vocational education system, a listing of local occupational education programs is provided in Appendix B. Also included in this Appendix is an overview of the state's vocational education delivery system.

The occupations included in the *Outlook* are not all-inclusive, but illustrative of the nature of change and growth in the Massachusetts economy. The descriptions were written with the aid of the *Dictionary of Occupational Titles* (Fourth Edition), the *Occupational Outlook Handbook* (1986-87 Edition), the *Guide for Occupational*



*Exploration*, research reports produced by the Massachusetts Department of Employment and Training, publications on careers produced by industry and professional groups, and interviews with professionals and human resource personnel in representative firms. The information about future employment prospects in these occupations was derived from state and federal employment projections data.

There is a great deal of work being done in schools and vocational programs in the areas of social support for clients, personal goal clarification, and instruction in job search techniques. Career libraries generally do a good job of providing access to national publications such as the *Dictionary of Occupational Titles* and the *Guide for Occupational Exploration*. Many colleges, universities, and training institutions operate experiential education programs (such as cooperative education and internships) to expose students to possible careers before graduation. Most programs at the postsecondary level have placement offices designed to bring student job seekers and prospective employers together by preparing job seekers to look for work or by responding to immediate job vacancies. But the long-range success of these services depends on how well they incorporate timely labor market information into their activities.

The *Massachusetts Occupational Outlook* augments these services. It supplements information about individual careers with the best economic analysis available and draws connections between work and education. It enhances career resources published at the national level by providing detailed information about occupational and career opportunities in this state. But because information about something as changeable as the behavior of labor markets can become outdated, the *Outlook* also provides users with important insights into the processes used to examine economic trends and evaluate occupational opportunities. By using this publication, counselors and vocational specialists can help their clients make more informed occupational and career decisions.

## Accountant or Auditor

Accounting is a broad field offering several career paths and a number of interesting specialties. The two largest career options are public accounting and management accounting. Accountants in public practice provide services to business and individuals on a fee basis, while management accountants work for a single employer such as a commercial business or industrial firm. Accountants are also employed by government agencies, colleges and universities, hospitals, and a variety of business services.

Public accounting firms audit financial records and operating procedures, prepare tax returns and financial statements, provide management advice, and render professional opinions about the overall financial well-being of their clients. The standard professional credential in the field is the Certified Public Accountant (CPA). In Massachusetts, certification as a public accountant requires three years' experience and the passage of a comprehensive exam, the uniform CPA Examination, which is also used in other states. CPA firms range in size from sole proprietorships to large and complex organizations similar to law firms. In the large firms, there are layers of staff accountants, senior accountants, managers, and finally a small number of partners, who direct the firm and share in its profits. The so-called "big eight" accounting firms (including Arthur Andersen, Coopers and Lybrand, Peat Marwick Mitchell) have offices throughout the United States and abroad. The "big eight" recruit heavily on college campuses to fill an enormous number of entry-level positions. The Boston branch of one of them, for example, expects to hire as many as one hundred four-year accounting graduates this year.

About one-half of all accounting graduates go into public accounting right out of school. Large firms are popular because of the career ladder, professional contacts, and sheer number and range of accounting assignments they offer. Many find the training invaluable preparation for the CPA exam. New hires, called staff accountants, often perform the basic tasks associated with conducting an audit or preparing a tax return. They count cash on hand, inspect journal and ledger entries, review canceled checks and expenses, and verify inventories under the supervision of an "in-charge" or senior accountant. The hours are long, particularly during tax season when sixty-hour weeks are common, and the work frequently involves a great deal of travel. Pressure to pass the CPA exam and to excel is very great in these firms. There is a tendency to move new staff either "up or out" within three or four years. Many firms maintain out-placement services to help employees find more appropriate jobs elsewhere.

While a majority of new hires start out in public practice, only around 25 percent of all accountants remain there. Actually, around 60 percent of all practicing accountants are employed in management accounting and financial management.

Management accountants develop, produce, and analyze the data necessary for monitoring the effectiveness of a business and planning its future. Opportunities for new hires are found in manufacturing, insurance, banking, construction, financial services, hospitality -- virtually everywhere there is money to be made, spent, or accounted for. Accountants usually specialize in managerial, tax or cost accounting, auditing, or a related field. In general, they maintain accounting records, research discrepancies, prepare and analyze statements, and produce reports for senior management. Each area within accounting has its own career ladder. In banking, a new hire may progress from accountant (after two to four years), to accountant specialist analyst (after two years), to junior officer or officer. While the CPA is often preferred, it is not required for many jobs in management accounting. Other valuable credentials include certification in management accounting (CMA) or internal auditing (C/A).

While opportunities in management accounting are plentiful, they may not always be immediately visible to new college graduates. Recruiting is not as highly organized as it is in public accounting. Job openings tend not to be cyclical or as numerous, and because they can occur in almost any business or government agency, they are not as geographically concentrated as those in public accounting firms. Hiring is done through personnel departments, which may or may not have enough openings to recruit on campus.

### **Education, Training, and Hiring Requirements**

An entry-level position as a staff accountant in a CPA firm usually requires a four-year degree in accounting from an accredited institution. In banking, insurance, and other industries that employ large numbers of accountants and finance specialists, the line may blur between accounting or finance as the degree of choice. Associate degree graduates can find employment in management accounting as junior accountants. Computers have revolutionized the way businesses and other organizations manage money; therefore, familiarity with computer technology is essential for anyone entering the field today. Computerization of financial and administrative records has led to the creation of a new field, Electronic Data Processing (EDP) auditing, and certification as a Certified Information Systems Auditor (CISA).

Employers stress strong academic performance and related work experience, gained either through summer jobs or cooperative education, as necessary prerequisites for highly competitive entry-level positions. Important personal characteristics include a professional commitment to the field of accounting, clear and logical thinking, attention to detail, a genuine respect for accuracy, and the ability to



get along well with others. Success on the job depends on the individual's accuracy rate, team orientation, flexibility, drive, and ability to relate well with co-workers and clients. An MBA does not automatically mean a promotion if these other factors are absent.

### **Industries That Employ Accountants**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
893	Accounting, Auditing, Bookkeeping	20.0
901	Federal Government	6.7
739	Miscellaneous Business Service	5.6
602	Commercial Banks	5.0
581	Eating and Drinking Places	4.2
902	State Government	3.0
367	Electronic Components and Accessories	2.5
357	Office & Computing Machinery	2.1
903	Local Government	1.9

### **Occupational Earnings**

Starting salaries at the bachelor's degree level for all types of accountants and auditors vary widely, from \$17,000 in small firms or nonprofits to as much as \$26,000 in large urban firms. Experienced accountants may earn in excess of \$50,000 per year.

### **Employment Outlook**

The strength of the emerging service sector, a favorable business climate, and changes in tax and investment laws have all been positive influences in the fields of accounting and auditing. If these factors remain unchanged, the outlook for these occupations is extremely favorable. In 1984 there were over 29,500 practicing accountants, auditors, and bookkeepers in Massachusetts. That figure is expected to increase by as much as one-third by 1995.



## **Related Occupations**

Systems Accountant  
Internal Auditor  
Tax Auditor  
Property Accountant

Cost Accountant  
Budget Accountant  
Tax Accountant

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Aquinas Junior College--Milton  
303 Adams Street  
Milton, MA 02186  
(617) 696-3100

Aquinas Junior College--Newton  
15 Walnut Park  
Newton, MA 02158  
(617) 969-4400

Bay Path Junior College  
588 Longmeadow Street  
Longmeadow, MA 01106  
(413) 567-0621

Bay State Junior College  
122 Commonwealth Avenue  
Boston, MA 02116  
(617) 236-8000

Becker Junior College--Leicester  
3 Paxton Street  
Leicester, MA 01524  
(508) 892-8122

Becker Junior College--Worcester  
61 Sever Street  
Worcester, MA 01609  
(508) 791-9241

Greenfield Community College  
One College Drive  
Greenfield, MA 01301  
(413) 774-3131

Holyoke Community College  
303 Homestead Avenue  
Holyoke, MA 01040  
(413) 538-7000

Lasell Junior College  
1844 Commonwealth Avenue  
Newton, MA 02166  
(617) 243-2225

Massachusetts Bay Community College  
50 Oakland Street  
Wellesley Hills, MA 02181  
(617) 237-1100

Middlesex Community College  
Springs Road  
Bedford, MA 01730  
(617) 275-8910

Mount Wachusett Community  
College  
444 Green Street  
Gardner, MA 01440  
(508) 632-6600

Bristol Community College  
777 Elsbree Street  
Fall River, MA 02720  
(508) 678-2811

Bunker Hill Community College  
New Rutherford Avenue  
Charlestown, MA 02129  
(617) 241-8600

Cape Cod Community College  
Route 132  
West Barnstable, MA 02668  
(508) 362-2131

Central New England College of  
Technology  
Worcester Junior College  
768 Main Street  
Worcester, MA 01610  
(508) 755-4313

Chamberlayne Junior College  
128 Commonwealth Avenue  
Boston, MA 02116  
(617) 536-4500

Endicott College  
376 Hale Street  
Beverly, MA 01915  
(508) 927-0585

Fisher Junior College  
118 Beacon Street  
Boston, MA 02116  
(617) 262-3240

*Four-Year (Bachelor's) Degree:*

American International College  
1000 State Street  
Springfield, MA 01109  
(413) 737-7000

Newbury Junior College  
921 Boylston Street  
Boston, MA 02115  
(617) 262-9350

North Shore Community College  
3 Essex Street  
Beverly, MA 01915  
(508) 927-4850

Northern Essex Community College  
100 Elliott Street  
Haverhill, MA 01830  
(508) 374-0721

Quincy Junior College  
34 Coddington Street  
Quincy, MA 02169  
(617) 786-8777

Quinsigamond Community College  
670 West Boylston Street  
Worcester, MA 01606  
(508) 853-2300

Roxbury Community College  
625 Huntington Avenue  
Boston, MA 02115  
(617) 734-1960

Springfield Technical  
Community College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

Gordon College  
255 Grapevine Road  
Wenham, MA 01984  
(508) 927-2300

Anna Maria College for Men and  
Women  
Sunset Lane  
Paxton, MA 01612  
(508) 757-4586

Assumption College  
500 Salisbury Street  
Worcester, MA 01609  
(508) 752-5615

Atlantic Union College  
South Lancaster, MA 01561  
(508) 365-4561

Babson College  
Babson Park  
Wellesley, MA 02157  
(617) 235-1200

Bentley College  
Beaver and Forest Streets  
Waltham, MA 02254  
(617) 891-2244

Boston College  
Lyons Hall 120  
Chestnut Hill, MA 02167  
(617) 552-3100

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2000

Bridgewater State College  
Tillinghast Hall  
Bridgewater, MA 02324  
(617) 697-1237

Merrimack College  
North Andover, MA 01845  
(508) 683-7111

Nichols College  
Dudley, MA 01570  
(508) 943-1560

North Adams State College  
Church Street  
North Adams, MA 01247  
(413) 664-4511

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2000

Salem State College  
352 Lafayette Street  
Salem, MA 01970  
(508) 745-0556

Simmons College  
300 The Fenway  
Boston, MA 02115  
(617) 738-2000

Southeastern Massachusetts  
University  
North Dartmouth, MA 02747  
(508) 997-9321

Stonehill College  
North Easton, MA 02357  
(508) 238-1081

Suffolk University  
Beacon Hill  
Boston, MA 02114  
(617) 723-4700

Elms College  
291 Springfield Street  
Chicopee, MA 01013  
(413) 598-8351

College of the Holy Cross  
Worcester, MA 01610  
(508) 793-2443

Eastern Nazarene College  
23 East Elm Avenue  
Wollaston, MA 02170  
(617) 773-2373

Emmanuel College  
400 The Fenway  
Boston, MA 02115  
(617) 277-9340

Fitchburg State College  
160 Pearl Street  
Fitchburg, MA 01420  
(508) 345-2151

University of Lowell  
One University Avenue  
Lowell, MA 01854  
(508) 452-5000

University of Massachusetts--  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222

Western New England College  
1215 Wilbraham Road  
Springfield, MA 01119  
(413) 782-3111

Worcester State College  
486 Chandler Street  
Worcester, MA 01602  
(508) 793-8000

#### **Where to Write for More Information**

American Institute of Certified  
Public Accountants  
1211 Avenue of the Americas  
New York, NY 10036

National Association of  
Accountants  
P.O. Box 433  
10 Paragon Drive  
Montvale, NJ 07645

National Society of Public  
Accountants & Accreditation  
Council for Accountancy  
1010 North Fairfax Street  
Alexandria, VA 22314

The Institute of Internal  
Auditors  
249 Maitland Avenue  
P.O. Box 1119  
Altamonte Springs, FL 32701

The EDP Auditors' Association  
Carol Stream, IL 60188



## **Air Conditioning, Heating, and Refrigeration Mechanic**

These are skilled workers who install, service, and repair heating and air conditioning systems and refrigeration systems. Heating and air conditioning systems control the temperature of homes, office buildings, department stores, and other buildings. Refrigeration systems are installed primarily in industrial and commercial buildings for safe storage of food, drugs, and other perishable items. Since these systems involve piping or ductwork as well as machinery, mechanics may specialize in installation or in maintenance and repair of the systems. Some mechanics work in specific kinds of equipment, such as commercial refrigerators or hot air furnaces.

Furnace installers follow specifications or blueprints to install oil, gas, electric, solid-fuel, multifuel, and solar energy heating systems. They position the equipment, for which they may lay a fireproof foundation, and install supply lines, ducts, vents, pumps, and other components. They also install thermostats, make wiring connections, and check the system for proper operation.

Oil burner servicers and installers work with automatic oil-burning equipment such as furnaces, boilers, tanks, supply lines, and fill and vent pipes. They install thermostats, blowers, dampers, and other controls and check that the system is functioning properly. They also service the system and repair or replace equipment.

Air conditioning and refrigeration mechanics follow specifications or blueprints to install central air conditioning systems and refrigeration equipment. They position equipment such as motors and condensers and then assemble and connect refrigeration lines, electric controls, and ductwork. Mechanics analyze problems such as equipment malfunctions and service systems regularly by lubricating machinery, adding refrigerant, adjusting valves, and checking for leaks.

Heating, air conditioning, and refrigeration mechanics use a variety of tools, including hammers, wrenches, drills, pipe cutters and benders, and acetylene torches. They also use instruments such as thermometers, manometers, voltmeters, and pressure gauges to check air flow, electrical circuits, burners, and other components of the systems. Mechanics frequently lift and carry heavy loads since they usually carry their tools and parts with them to the job site. They may work in high places, inside or outside, or in awkward or cramped positions. They are exposed to hazards such as electrical shocks, burns, and muscle strain.

### **Education, Training, and Hiring Requirements**

Most heating, air conditioning, and refrigeration mechanics start as assistants to experienced mechanics and acquire their skills on the job. Many high schools, vocational schools, and junior and community colleges offer programs in this

occupation. Graduates of these programs require less training and are preferred by employers. Several unions run apprenticeship programs which last four years and require applicants to have a high school diploma and pass a mechanical aptitude test.

This occupation requires the ability to understand mechanical concepts and the principles related to air conditioning, refrigeration, and heating systems. A basic understanding of microelectronics is desirable because of its increasing use in equipment controls. Manual dexterity and good physical condition are also necessary. Employers prefer high school graduates with course work in mechanical drawing, blueprint reading, and electronics.

Experienced mechanics may take courses periodically to keep up with changes in technology. Mechanics may advance to positions as supervisors and may open their own contracting businesses.

### **Industries That Employ Air Conditioning, Heating and Refrigeration Mechanics**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
171	Plumbing, Heating, Air Conditioning	44.6
598	Fuel Dealers	25.1
507	Hardware, Plumbing & Heating Equipment	5.3
176	Roofing, Siding, and Sheet Metal Work	4.1
762	Electrical Repair Shops	2.9
806	Hospitals	2.9
517	Petroleum and Petroleum Products	2.7
506	Electrical Goods	1.8
901	Federal Government	1.6
572	Household Appliance Stores	1.1

Heating, air conditioning, and refrigeration mechanics held 5,480 jobs in Massachusetts in 1984. Most air conditioning and refrigeration mechanics are employed by cooling and heating contractors. Fuel oil dealers employ most oil burner mechanics. Other employers include electrical repair shops, appliance stores, hospitals, and the federal government.

### **Occupational Earnings**

In Massachusetts, entry-level hourly earnings for heating, air conditioning, and refrigeration mechanics range from \$6 to \$9. Wages for the typical worker range from \$8 to \$11; the most experienced workers earn \$9 to \$12. Although mechanics usually work a forty-hour week, they may work overtime during the peak seasons of summer and winter.

## **Employment Outlook**

Heating, air conditioning, and refrigeration mechanics are not as affected by economic downturns as other occupations. Maintenance of existing systems and installation of new, advanced equipment in existing buildings make up a large portion of the work. The increasing demand for new energy-saving systems will contribute to making this one of the fastest-growing occupations requiring a high school diploma. The number of jobs is projected to increase by 22 percent, creating 1,190 new jobs through 1995.

Average employment growth is expected in this occupational field, with job opportunities generated from population and economic expansion. As new residential, commercial, and industrial structures are built, more heating, air-conditioning, and refrigeration mechanics will be needed to install climate control systems. In addition, growing concern about energy management and conservation should prompt installation of new energy-saving heating and air-conditioning systems in existing homes and buildings. Maintenance of existing systems will also create job opportunities.

## **Related Occupations**

Electrician  
Pipefitter  
Plumber

Sheet-metal Worker  
Electrical Appliance Servicer  
Boilermaker

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Franklin Institute of Boston  
41 Berkeley Street  
Boston, MA 02116  
(617) 423-4635

Massasoit Community College  
One Massasoit Boulevard  
Brockton, MA 02402  
(508) 588-9100

Massasoit Community College  
The Technical Institute at Blue Hills  
100 Randolph Street  
Canton, MA 02021  
(617) 828-5800

Springfield Technical Community  
College  
Armory Square  
Springfield, MA 01105  
(413) 781-7822

### *Vocational Education Programs:*

See Appendix C



## **Where to Write for More Information:**

Air Conditioning & Refrigeration  
Institute  
1501 Wilson Blvd.  
Arlington, VA 22209

Air Conditioning Contractors of  
America  
1228 17th Street, N.W.  
Washington, D.C. 20036

Associated Builders &  
Contractors  
729 15th Street, N.W.  
Washington, D.C. 20005

Refrigeration Service Engineers  
Society  
1666 Rand Road  
Des Plaines, IL 60016

## **Architect**

An architect designs the spaces in which we live, work, and play. These spaces must meet many requirements -- they must be functional, attractive, safe, economical, and suited to the needs of the people who use them. An architect must balance all these factors when designing a building and therefore must have a great deal of creative problem-solving ability, as well as skills in design, engineering, management, and supervision.

Architects are involved in all phases of a building project, from the initial discussions with a client (who may be an individual or an organization) through actual construction. The architect and the client first discuss the purpose, cost, and requirements of the project; then the architect prepares a report based on these discussions and scaled drawings of the architect's ideas for the project.

After acceptance of the initial proposals, the architect incorporates changes required by the client into the final construction documents. These documents include such things as floor plans, elevations, heating and cooling systems, plumbing, landscaping, and building materials. In developing these documents, the architect must be careful to follow all building codes, zoning laws, fire regulations, and ordinances that require access for handicapped people.

Besides designing the building, the architect may also help the client obtain construction bids, choose a contractor, and negotiate the construction contract. During construction, the architect visits the site frequently to make sure the contractor is adhering to the design, using the correct materials, and providing the quality of work specified in the plans.

Schools, office buildings, hospitals, churches, airports, and stores are included in the wide variety of buildings designed by architects. Sometimes architects design



multibuilding complexes for college campuses, industrial parks, or shopping malls. Sometimes they work on the renovation of existing construction. In large architectural firms and on large projects, architects often specialize in one phase of the work. Meeting deadlines is a necessary part of an architect's job; working nights and weekends is common.

Though closely related to the work of architects, landscape architecture is usually classified as a separate occupation. A landscape architect is more than a sophisticated gardener. A person working in this occupation may determine how land will be used by large groups of people; for example, a landscape architect may be involved in the planning of national and state parks, new towns, and highways. To create an attractive environment, a landscape architect prepares grading (topographic) plans, analyzes the natural features of a site, and decides the location of landscape elements -- trees, shrubs, fences, walls, pools, lighting, walkways.

The work of architects and landscape architects sometimes overlaps. They share many of the same methods and theories. Their educations, which include design, history, and technology, are similar. But, generally speaking, landscape architects focus on horticulture and geology, while architects focus on building design and construction.

### **Education, Training, and Hiring Requirements**

Persons who plan a career in architecture should be able to work independently and in a competitive environment. Leadership, the ability to work with others, flexibility, and the ability to accept and build upon criticism are other necessary qualities. An artistic gift is useful; the applicant should at least be able to make reasonable freehand sketches.

Admission to most schools of architecture is very competitive. In high school, the student should take a college preparatory course with emphasis on math, English, physics, and the humanities. Computer and business classes are also helpful. Drafting classes are not as desirable as the development of freehand drawing and sketching skills. It is a good idea for students to visit a local architect's office and the design studios of a school of architecture.

The most common degree programs are the five-year Bachelor of Architecture and the six-year Master of Architecture. After acquiring a degree and three years of experience as an intern in an architect's office, a person is eligible to take the four-day Architecture Registration Examination. (All states require architects to be licensed, or registered.) The exam, which is given annually, is rigorous and may require more than one attempt. Passing the exam is necessary for a license to practice architecture.

New graduates usually start in architectural firms where they prepare drawings and models under the direction of a licensed architect. In large firms, architects may become supervisors or partners. For many, the goal is to establish one's own firm.

### **Industries That Employ Architects**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
891	Engineering and Architectural Services	92.2
152	Residential Building Construction	4.7

### **Occupational Earnings**

Architects' income varies according to experience, firm size, and location. Partners in established firms and solo practitioners earn more than salaried employees but are subject to changing economic conditions and face the same challenges as others in business for themselves.

### **Employment Outlook**

Opportunities for architects are closely related to the health of the economy, especially the construction industry and the construction of nonresidential buildings such as office complexes, factories, and shopping malls.

Employment in this occupation is expected to rise faster than average although growth will be slower than in recent years. However, during recessionary periods when construction has slowed, architects will face competition for job openings or clients.

Regardless of economic conditions the best job opportunities are with the most prestigious firms which offer the best potential for career advancement. The increasing usage of computer technologies such as computer-aided design will not adversely affect employment of architects because computer-aided technologies are being used to improve the quality of building designs rather than to reduce the need for architects.

### **Related Occupations**

Building Contractor	Industrial Designer
Civil Engineer	Drafter
Urban Planning	Surveyor
Interior Designer	

## **Institutions Providing Training in Massachusetts**

### *Four-Year (Bachelor's) Degree:*

Boston Architectural Center  
School of Architecture  
320 Newbury Street  
Boston, MA 02115  
(617) 536-3170

Hampshire College  
Amherst, MA 01002  
(413) 549-4600

Massachusetts College of Art  
621 Huntington Avenue  
Boston, MA 02115  
(617) 232-1555

Massachusetts Institute of  
Technology  
77 Massachusetts Avenue  
Cambridge, MA 02139  
(617) 253-4791

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2000

University of Massachusetts-  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222

Wellesley College  
Wellesley, MA 02181  
(617) 235-0320

Wentworth Institute of  
Technology  
550 Huntington Avenue  
Boston, MA 02115  
(617) 442-9010

### **Where to Write For More Information:**

Education Programs  
The American Institute of  
Architects  
1735 New York Avenue, N.W.  
Washington, D.C. 20006

The Association of Collegiate  
Schools of Architecture, Inc.  
1735 New York Avenue, N.W.  
Washington, D.C. 20006

The National Council of  
Architectural Registration  
Boards  
1735 New York Avenue, N.W.  
Suite 700  
Washington, D.C. 20006

American Society of Landscape  
Architects  
1733 Connecticut Avenue, N.W.  
Washington, D.C. 20009



## **Automotive Body Repairer**

Automotive body repairers straighten bent frames, remove dents, and replace crumpled parts that are beyond repair on vehicles that have been involved in traffic accidents. Usually, these workers can fix all types of vehicles but most work on cars and small trucks.

Body repairers generally work alone under the direction of a supervisor who determines which parts are to be restored or replaced and how much time a job should take. In large shops, body repairers may be assisted by helpers or apprentices or may specialize in a particular type of repair.

Body repairers use special machines and tools to restore damaged frames and body sections to their original shapes and locations. Repairers chain or clamp the frames and sections to alignment machines that use hydraulic pressure to align the damaged metal.

Badly damaged sections of an auto are repaired and replaced using a pneumatic metal-cutting gun and an acetylene torch. Less serious dents are pushed or knocked out with a hydraulic jack, hand prying bar, hand tools, or pneumatic hammers. Small dents that cannot be worked out are filled with plastic or solder. On metal panels, repairers file and grind the hardened filler to the original shape and sand it before painting. In smaller shops, repairers also do the painting.

The use of plastic in body parts, especially on newer automobiles, has created a new type of repair. The repairer applies heat from a hot air welding gun or immerses the damaged part in hot water and presses the softened part back into its original shape by hand. Plastic parts that are more difficult to repair are replaced.

Body repair work has variety and challenge, with each damaged vehicle presenting a different problem. Repairers must develop appropriate methods for each job by using their broad knowledge of automobile construction and repair techniques.

Auto body repairers work indoors in body shops which are noisy because of the banging of hammers against metal and the whirl of power tools. Most shops are well ventilated, but often they are dusty and smell of paint. Body repairers often work in awkward or cramped positions, and much of their work is strenuous and dirty. Hazards include cuts from sharp metal edges, burns from torches and heated metal, injuries from power tools, and fumes from paint.

### **Education, Training, and Hiring Requirements**

There is no formal educational requirement for auto body repairers, although good reading and basic mathematics skills are essential. Completion of a formal training program in automotive repair is highly desirable because advances in

technology have greatly changed the structure of the components and even the materials used in automobiles.

Many automotive body repairers enter the occupation by transferring from related helper positions. Helpers begin by assisting body repairers in smaller repairs and progress to the most difficult tasks such as body straightening. Generally, skill in all aspects of body repair requires three to four years of on-the-job training.

Auto body repairers must buy their own hand tools, but employers usually furnish power tools. Trainees generally accumulate tools as they gain experience, and many have thousands of dollars invested in tools.

### **Industries That Employ Auto Body Repairers**

Most auto body repairers work either in auto repair shops or for auto dealerships. An experienced body repairer can go to work for an insurance company as an automobile damage appraiser.

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
753	Automotive Repair Shops	62.6
551	New and Used Car Dealers	27.1
552	Used Car Dealers	2.4
531	Department Stores	2.3

### **Occupational Earnings**

A typical wage for an auto body repairer is between \$7.25 and \$9.94 per hour. The most experienced repairers earn substantially more. Helpers and trainees usually earn from \$5.00 to \$8.00 per hour.

Many body repairers are paid a commission, usually about half of the labor cost charged to a customer, with a guaranteed minimum weekly salary. Helpers generally receive an hourly rate until they are skilled enough to work on commission and work between 40 and 48 hours per week.

### **Employment Outlook**

Employment of automotive body repairers are expected to increase more slowly than the average for all occupations through the year 2000. As the number of motor vehicles in operation grows with the nation's population, the number damaged in accidents will also increase. New, lighter weight automotive designs are prone to greater collision damage than older, heavier designs. Employment growth will be dampened, however, as automobiles increasingly are manufactured with plastic body

panels, which are easier to repair and replace than steel panels and do not rust. The need to replace experienced repairers who transfer to other occupations, retire, or stop working for other reasons will account for the majority of job openings.

### **Related Occupations**

Automotive Repair Service Estimator  
Automotive Mechanic

Automotive Body Customizer  
or Painter  
Diesel Mechanic

### **Institutions Providing Training in Massachusetts**

United Technical Schools  
83 Werther Street  
West Springfield, MA 01089

Assabet Valley Voc-Tech  
Fitchburg Street  
Marlborough, MA 01752

Blue Hills Regional Voc-Tech  
800 Randolph Street  
Canton, MA 02021

Greater New Bedford Tech  
1121 Ashley Boulevard  
New Bedford, MA 02745

Whittier Vocational School  
115 Amesbury Line Road  
Haverhill, MA 01830

### ***Vocational Education Programs:***

See Appendix C

### **Where to Write for More Information:**

Automotive Service Industry  
Association  
444 North Michigan Avenue  
Chicago, IL 60611

National Association of Trade and  
Technical Schools  
2251 Wisconsin Avenue, N.W.  
Washington, D.C. 20007

Automotive Service Councils, Inc.  
188 Industrial Drive  
Suite 112  
Elmhurst, IL 60126



## **Automotive Mechanic**

Automotive mechanics, often called service technicians, repair and service motor vehicles with gasoline engines. Before any repair can be made, a mechanic must quickly and accurately diagnose the source of the problem. This diagnostic ability is one of the mechanic's most valuable skills and requires good reasoning ability and a thorough knowledge of automobiles.

When repairs are to be made, the mechanic first gets a description of the problem from either the owner or the repair service estimator who wrote the repair order. The mechanic then either test drives the vehicle or uses testing equipment such as engine analyzers, spark plug testers, or compression gauges to locate the problem. The defective part is then either repaired or replaced.

During routine service, mechanics inspect, lubricate, and adjust engines and other components and repair or replace parts before they cause breakdowns. Mechanics usually follow a checklist to be sure they examine all important parts.

Mechanics use a variety of tools in their work. They use power tools such as pneumatic wrenches to remove bolts quickly, machine tools such as lathes and grinding machines to rebuild brakes and other parts, welding and flamecutting equipment to remove and repair exhaust systems, jacks and hoists to lift cars and engines, and a growing variety of electronic service equipment such as infrared engine analyzers and computerized diagnostic devices. Mechanics also use common hand tools such as screwdrivers, pliers, and wrenches to work on small parts and get at hard-to-reach places.

Auto mechanics in larger shops may specialize in certain repairs such as auto transmissions, tune-ups, automotive air conditioning, front-end alignment, brake repairs, or automotive radiators.

Mechanics work indoors, with an occasional road repair. Most repair shops are well ventilated and lighted, but some are drafty and noisy. Mechanics frequently work with dirty, greasy parts and in awkward positions. They often must lift heavy parts and tools. Minor cuts, burns, and bruises are common, but serious injuries can be prevented if the work area is kept clean and orderly.

### **Education, Training, and Hiring Requirements**

There is no formal educational requirement for entry into automotive mechanics. For entry-level jobs, employers hire people with mechanical aptitude and a knowledge of automobiles. Training in automotive mechanics at either a vocational or technical school is desirable, however, because of the technological advances in this

field. Courses in electronics are also desirable because electronic controls are increasingly being designed into automotive components.

Many mechanics still learn the trade primarily on the job. Although a small number of persons enter the occupation through a formal three- or four-year apprenticeship program, beginners usually start as helpers doing routine tasks such as gas station attending, then advance to more difficult repairs, and eventually reach a journeyman level -- that is, the mechanic is familiar with all types of repairs. This progression may take between four and six years. Certain specialists such as radiator mechanics or brake specialists, who do not need an all-around knowledge of automotive repair, may learn their jobs in about two years.

Mechanics usually buy their hand tools, and beginners are expected to accumulate tools as they gain experience. Many experienced mechanics have thousands of dollars invested in tools. Employers furnish power tools, engine analyzers, and other test equipment.

### **Industries That Employ Automotive Mechanics**

Most auto mechanics work for auto dealerships, automotive repair shops, or gasoline service stations. Mechanics with sales ability sometimes become sales representatives for auto parts manufacturers.

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
551	New and Used Car Dealers	30.6
753	Automobile Repair Shops	19.1
554	Gasoline Service Stations	13.6
553	Auto and Home Supply Stores	6.1
531	Department Stores	4.4
371	Motor Vehicles and Equipment	3.9
501	Motor Vehicles, Parts and Supplies	2.3
903	Local Government	2.3
552	Used Car Dealers	2.1
508	Machinery Equipment and Supplies	1.7

### **Occupational Earnings**

A typical wage for a skilled automotive mechanic is \$8.50 to \$12.00 per hour, although some earn substantially more. Service mechanics who perform routine service and make minor repairs earn approximately \$5.00 to \$8.00 per hour.

Many experienced mechanics work on commission. Under this method, weekly earnings depend on the amount of work completed over a 40- to 48-hour work week.



## **Employment Outlook**

Job opportunities in automotive mechanics are expected to be plentiful for persons who complete training programs in high school, vocational and technical schools, or community colleges. Persons without formal mechanic's training are likely to face competition for entry-level jobs.

Employment of automotive mechanics is expected to increase more slowly than the average for all occupations through the year 2000. Declining employment in gasoline service stations, together with little change in employment in auto dealerships, will affect growth in independent automotive repair shops.

Nevertheless, the number of mechanics is expected to increase because of expansion in the driving age population, which in turn will increase the number of motor vehicles on the road. In addition, the growing complexity of automotive technology will necessitate that cars be serviced by experienced mechanics. On the other hand, improvement in the reliability of automobiles, together with less frequent requirements for routine service, are expected to somewhat dampen employment growth.

Most job openings will occur because of the large number of workers employed in this occupation. Replacements will be needed as experienced workers transfer to other occupations, retire, or stop working for other reasons.

## **Related Occupations**

Automotive Body Repairer, Customizer,  
or Painter  
Automotive Repair Service Estimator

Diesel Mechanic  
Motorcycle Mechanic

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Franklin Institute of Boston  
41 Berkeley Street  
Boston, MA 02116  
(617) 423-4635

Mount Wachusett Community  
College  
444 Green Street  
Gardner, MA 01440  
(508) 632-6600

Massachusetts Bay Community  
College  
50 Oakland Street  
Wellesley Hills, MA 02181  
(617) 237-1100

Springfield Technical Community  
College  
Armory Square  
Springfield, MA 01105  
(413) 781-7822

Middlesex Community College  
Springs Road  
Bedford, MA 01730  
(617) 275-8910

*Vocational Education Programs:*

See Appendix C

**Where to Write for More Information:**

National Association of Trade &  
Technical Schools  
2251 Wisconsin Avenue, N.W.  
Washington, D.C. 20007

U.S. Department of Labor  
Employment & Training  
Administration  
Bureau of Apprenticeship & Training  
Patrick Henry Bldg.  
601 D Street, N.W.  
Washington, D.C. 20213

Motor and Equipment Manufacturers'  
Association  
Technical Training Council  
222 Cedar Lane  
Teaneck, NJ 07666

Associate Degree Apprenticeship  
Programs  
National Automotive Dealers  
Association  
8400 Westpark Drive  
McLean, VA 22102

Automotive Service Industry  
Association  
444 North Michigan Avenue  
Chicago, IL 60611

General Motors Corporation  
General Motors Bldg.  
Detroit, MI 48202  
Attn: Product, Education &  
Training Section  
Northwood Institute  
Midland, MI 48640

Automotive Service Councils, Inc.  
188 Industrial Drive  
Suite 112  
Elmhurst, IL 60126

Ford Motor Company  
The American Road  
Dearborn, MI 48121  
Attn: Career Information

Motor Vehicle Manufacturers'  
Association of the U.S., Inc.  
300 New Center Bldg.  
Detroit, MI 438202

Automotive Service Association  
1901 Airport Freeway  
P.O. Box 929  
Bedford, TX 76021

MoTech Automotive Education  
Center  
The Chrysler Corporation  
35155 Industrial Road  
Livonia, MI 48150

## **Bartender**

Recipes are the stock in trade of bartenders, who need to know literally hundreds of concoctions of the liquid, and primarily alcoholic, variety. Most bartenders mix drinks, collect payment, order and stock supplies, and keep the bar area neat and attractive. More than a few have been known to dispense congeniality and a little wisdom along with the libations they serve. Like the characters Sam and Woody on the television program *Cheers*, the bartender has a reputation for exerting a calming influence and creating a friendly atmosphere for patrons at the local pub.

Restaurants and bars are the largest source of employment for bartenders, followed by hotels and private clubs. Over 13,000 people tended bar in Massachusetts in 1984.

### **Education, Training, and Hiring Requirements**

Bartenders learn their trade in a variety of ways -- through related employment as waitpersons, through observation, or by taking courses or workshops through a vocational school, or adult education program. A pleasant personality, good interpersonal skills, a well-groomed appearance, and a degree of physical stamina are the usual prerequisites for the job. In Massachusetts, bartenders must be 21 years of age. In view of the increased liability of bartenders and bar owners, those entering the occupation should become well-informed about the legal and social issues involved in serving alcoholic beverages.

### **Industries That Are Major Employers of Bartenders**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
581	Eating and Drinking Places	69.8
864	Civic and Social Associations	14.4
701	Hotels and Motels	9.0
799	Misc. Amusement, Recreation Services	4.9

## **Occupational Earnings**

Basic hourly pay for bartenders is in the \$5.00 to \$6.00 per hour range. However, the hourly pay can be heavily supplemented by tips and gratuities.

## **Employment Outlook**

Given the overall growth expected in food services, jobs in this occupation will grow by about 30 percent in the coming years.

Employment of bartenders is expected to grow much faster than average due mainly to the expected use in personal income, population growth and increased leisure time.

Although some bartenders acquire their skills by attending a bartending school, most learn on the job. Once the necessary bartending skills are acquired many use these skills in part-time work rather than as their primary occupation.

## **Related Occupations**

Bar Attendant

Cocktail Attendant

Tap Room Attendant

## **Institutions Providing Training in Massachusetts**

Boston Bartenders School of America  
719 Boylston Street  
Boston, MA 02116  
(617) 536-7272

New England Bartenders School  
811 Boylston Street  
Boston, MA 02116  
(617) 247-1600

Brockton Professional School of  
Bartending  
660 North Main Street  
Brockton, MA 02401  
(508) 588-8204

North Shore Bartending School  
450 Main Street  
Wakefield, MA 01880  
(617) 245-6701

## **Where to Write for More Information**

National Institute for the Food-Service  
Industry  
20 North Wacker Drive  
Suite 2620  
Chicago, IL 60606

Council on Hotel, Restaurant and  
Institutional Education  
Room S-208  
Henderson Building  
University Park, PA 16802



## **Bookkeeper or Accounting Clerk**

Bookkeepers and accounting clerks maintain up-to-date records of accounts and business transactions. They are employed in virtually every business, including federal, state, and local government agencies, retail establishments, manufacturing firms, schools, and hospitals. Bookkeepers and accounting clerks maintain financial records in journals and ledgers or on computers. They also prepare periodic financial statements that show all money received and paid out. While exact responsibilities vary with the size and scope of the business, nearly all bookkeepers and accounting clerks use calculating machines or computers.

In small firms, a general bookkeeper or accounting clerk may handle all the bookkeeping. This worker may be responsible for analyzing the records of all financial transactions, such as orders and cash sales; checking money taken in against money paid out to make sure accounts balance; processing payroll; and billing customers. Additional responsibilities can include answering telephone requests for information about orders and bills.

Large businesses usually employ several bookkeepers and accounting clerks who are directly responsible to the firm's accountant(s). Bookkeepers and accounting clerks tend to specialize in certain types of work, such as preparing statements of a company's income from sales; calculating daily operating expenses; working on payroll; preparing vouchers, invoices, and other financial records; or entering and reviewing information about accounts receivable and accounts payable on a computer.

Beginning bookkeepers record routine transactions; but as they gain experience, they may advance to more responsible assignments such as preparing income statements, reconciling accounts, and reviewing computer printouts. Some bookkeepers and accounting clerks are promoted to supervisory jobs, though advancement is generally limited unless an individual returns to a college or university to earn an accounting degree.

Bookkeeping and accounting clerks need to have good manual dexterity. They should enjoy working with numbers and concentrating on details since even a small mistake can be very serious. When working as part of a team, good communication and interpersonal skills are also important. Individuals frequently sit for long periods of time examining detailed numerical information, possibly on video terminal displays.

### **Education, Training, and Hiring Requirements**

High school graduates who have taken business arithmetic, bookkeeping, and principles of accounting meet the minimum requirements for most bookkeeping and accounting clerk jobs. Increasingly, however, employers prefer applicants with



accounting degrees from community or junior colleges or business schools. Prior working experience with knowledge of office procedures and automated equipment is helpful for students seeking jobs after graduation.

### **Industries That Employ Bookkeepers and Accounting Clerks**

Massachusetts employs 51,458 bookkeepers and accounting clerks who work in nearly every type of business throughout the state.

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
581	Eating & Drinking Places	3.1
541	Grocery Stores	2.3
739	Misc. Business Service	2.2
903	Local Government	2.2
594	Misc. Shopping Goods	2.2
602	Commercial and Stock Servings	2.0
508	Machinery, Equipment and Supplies	1.9
806	Hospitals	1.9
653	Real Estate Agents and Managers	1.8
641	Insurance Agents, Brokers and Service	1.8

### **Occupational Earnings**

Bookkeepers and accounting clerks earn between \$12,000 and 18,000 a year, with some making up to \$20,000. Positions in large cities or surrounding suburbs tend to pay more than similar jobs in rural areas.

### **Employment Outlook**

Employment of bookkeepers and accounting clerks is expected to grow more slowly than the average for all occupations through 1995. Nevertheless, job prospects should be good because of the need to replace workers who transfer to other occupations or stop working. Overall, replacement needs produce numerous openings each year. As for most clerical occupations, there is considerable movement into and out of the work force due to homemaking responsibilities, large numbers of part-time workers, and relatively low wages.

### **Related Occupations**

Bank Teller	Insurance Clerk
Collection Worker	Statistical Clerk

## **Institutions Providing Training in Massachusetts**

Kenyon - Campbell Business School  
55 Linden Street  
New Bedford, MA 02740  
(508) 992-5448

Metro South/West Employment &  
Training Administration  
P.O. Box 740  
Norwood, MA 02062  
(617) 769-4120

Assabet Valley Voc-Tech  
Fitchburg Street  
Marlborough, MA 01752

Department of Training &  
Manpower Development  
237 Essex Street  
Lawrence, MA 01840  
(508) 685-3527

Greenfield Community College  
One College Drive  
Greenfield, MA 01301  
(413) 774-3131

Skills  
150 Fearing Street  
Amherst, MA 01002  
(413) 253-9500

Massasoit Community College  
One Massasoit Boulevard  
Brockton, MA 02402  
(508) 588-9100

## **Bricklayer or Stone Mason**

Bricklaying and stone masonry are closely aligned trades. Bricklayers construct walls, partitions, chimneys, fireplaces, and other similar structures using brick, cinder or concrete blocks, structural tile, terra cotta, and gypsum blocks.

Bricklaying requires careful, accurate work. The completed surface must have a neat and uniform appearance. Bricklayers use almost all hand tools, including trowels, chisels, brickhammers, jointers, levels, gauge lines, and plumb bobs. Power saws are often used for cutting and fitting bricks and other masonry materials.

Stone masons build the stone exterior of structures; set stone in mortar; and move it into position with a mallet, hammer, or crowbar. Special hammers and abrasive saws are used, as well as power tools.

Bricklayers generally work outdoors on new building construction. The work can be strenuous because it may involve lifting and prolonged standing and stretching. Bricklayers are usually assisted by hod carriers (most often helpers who are informally learning the trade) who supply bricks and other materials, mix mortar, and set up and move scaffolding.

In putting up a wall, bricklayers usually use plumb lines and a level to build the corners. They then stretch a line from corner to corner to guide each course of layer of brick. They spread a layer of mortar with a metal trowel, place the brick on the mortar bed, and then tap it into place. Following blueprint specifications, bricklayers may need to cut bricks with a hammer and chisel and fashion them to fit around windows, doors, and other openings. Mortar joints are finished with joining tools to leave a neat and uniform appearance. Even though steel supports are commonly used at window and door openings, bricklayers may be asked to create brick arches to enhance the design of the construction.

Some bricklayers are employed in sewer construction or are involved in alteration work and remodeling. Some industries, like glass and steel producers, hire bricklayers to install and maintain fire brick and refractory brick linings in furnaces and kilns.

### **Education, Training, and Hiring Requirements**

Bricklayers and stone masons can pick up their skills informally by working as helpers or hod carriers and observing and learning from the more experienced workers. Another way to enter the profession is through a formal apprenticeship training program.

The most common requirements for entering an apprenticeship program are a high school diploma or GED, good physical stamina, and the ability to perform difficult tasks. Most programs also require that a beginning apprentice be from seventeen to twenty-four years old (with a possible adjustment for military service). Completion of an apprenticeship program requires between 4,500 to 6,000 hours of on-the-job and classroom training. It usually takes three to four years to finish and become a journey-level bricklayer.

Experienced bricklayers who have motivation and "people skills" can progress to supervisory positions or open their own contracting businesses.

### **Industries That Employ Bricklayers or Stone Masons**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
174	Masonry, Stonework and Plastering	55.8
154	Nonresidential Building Construction	24.9
177	Concrete Work	11.7
179	Miscellaneous Special Trade Contractors	6.6



## **Occupational Earnings**

Persons starting out as apprentice bricklayers earn between \$200 and \$250 per week. Journeymen bricklayers with several years of experience earn between \$500 and \$700 per week.

## **Employment Outlook**

Average employment growth is expected in this occupation. Population and business growth will create a need for new homes, factories, offices, and other structures. Also stimulating demand will be the increasing use of brick for decorative work on building fronts and in lobbies and foyers. Bricklayers specializing in refractory repair and those in the primary metals industry will experience employment declines.

## **Related Occupations**

Tilesetter

Plasterer Concrete Mason

Terrazzo Worker

## **Institutions Providing Training in Massachusetts**

Wentworth Institute of Technology  
550 Huntington Avenue  
Boston, MA 02115  
(617) 442-9010

## **Where to Write for More Information:**

Associated General Contractors  
of America, Inc.  
1957 E Street, N.W.  
Washington, D.C. 20006

## **Brokerage Clerk**

Brokerage clerks, also known as sales assistants, work in investment firms where they perform recordkeeping and clerical duties involved with the purchase and sale of securities such as stocks and bonds. Using calculators and rate tables, brokerage clerks write client orders for stock purchases and sales, compute federal and state transfer taxes and commission rates, and accept and deliver client securities and dividends. They also verify details on stock certificates, such as the owners' names, transaction dates, and distribution instructions, to ensure accuracy and conformance with



government regulations. These clerks determine the value of changes to the value of securities and inform clients of market fluctuations, stock purchases, and sales affecting the clients' accounts. Daily responsibilities include maintaining records of transactions, calculating totals, and summarizing the effects of the day's business on the holdings of the brokerage firm.

Brokerage clerks are employed by brokerage and investment firms throughout the state; however, most work for a small number of large firms that have offices in the Boston area. Since sales activity is affected by unexpected changes in the economy, the work pace fluctuates and can at times be very hectic.

### **Education, Training, and Hiring Requirements**

Brokerage clerks collect, organize, compute, and record numerical information involved in the transaction of securities. This occupation requires attention to detail and the ability to use calculators, adding machines, and computers to accurately compute and record numbers. Since brokerage clerks speak with clients by telephone, individuals considering employment in this occupation should enjoy working with people as well as with figures and performing work that is routine and detailed.

No specific training is required for this occupation; however, a high school diploma and some business experience is preferred. Additional preparation should include courses in business math, accounting, or bookkeeping.

### **Industries That Employ Brokerage Clerks**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
621	Security Brokers and Dealers	44.6
628	Security and Commodity Services	40.1
602	Commercial Banks	12.5

### **Occupational Earnings**

Brokerage clerks may work forty to sixty hours a week. Entry-level weekly salaries range from \$200 to \$245, increasing to \$250 to \$300 for typical workers. The most experienced clerks earn around \$430 per week.

### **Employment Outlook**

In 1984, more than one thousand brokerage clerks were employed in Massachusetts. This occupation is expected to experience faster-than-average growth and expand by 21 percent through 1995 as annual household incomes rise and the

popularity of investing increases. It should be noted, however, that major downturns in financial markets such as the one experienced in October 1987 affect the number of people required by this industry.

## **Related Occupations**

### **Trust-Securities Clerk**

## **Carpenter**

Carpentry is the largest skilled building trade in terms of employment. It offers a variety of work situations and environments. Job duties vary greatly depending upon the type of employers.

Carpenters are employed in most construction and renovation projects. They may work in the structural areas of construction, erecting the wood framework of structures and installing windows and doors. Carpenters may also do finishing work inside residential and commercial buildings. This type of carpentry includes constructing wood paneling, built-in cabinets, door and window moldings, and bookshelves. In addition, some carpenters are involved in floor installation and soundproofing and in such large-scale construction projects as docks and railroad trestles.

Working conditions differ greatly depending on the specific work involved, but carpenters generally must work standing up or squatting. There may also be some climbing. The tools used are basic hand tools such as hammers, saws, and chisels. Power tools like electric saws, drills, and power fastening devices are also used. (New and improved products are continually being introduced on the market to increase safety and efficiency.)

Carpenters may work either inside or out, as determined by the weather conditions and the type of project. Because of the nature of the work, there is always the possibility of injury from slips or falls or from contact with sharp or rough materials. There is also a danger in operating tools incorrectly.

The occupation of millwright is sometimes considered a specialized area within carpentry. Millwrights are often known as "jacks of all trades" because of the variety of skills that their craft entails. They must be able to work with industrial machinery and must have a thorough knowledge of dismantling, reassembling, and aligning complex equipment. The ability to read blueprints is essential, along with an understanding of how building materials such as steel, concrete, and wood are used.

Most carpenters rise to journeyman status after beginning as apprentices or learning the trade informally as helpers. Journeyman carpenters are employed mainly by contractors and home builders. Some carpenters alternate between working for contractors and working for themselves on small jobs. Other employers include government agencies and large firms, like factories, hotels, and office buildings, that maintain a staff to do their own construction and repair jobs.

Carpenters can advance to carpentry supervisors, and they usually have greater opportunities than most other construction workers to become general construction supervisors because they gain an overview of the entire construction process through their work. Some journeymen carpenters go out on their own and become independent contractors.

### **Education, Training, and Hiring Requirements**

A four-year apprentice program is the usual route to becoming a journeyman carpenter. Training includes instruction in drafting, blueprint reading, mathematics for layout work, and the use of woodworking tools and machines. Excellent manual dexterity and good physical condition are necessary. Carpenters working on building construction projects should have a good sense of balance and be unafraid of high structures. Employers also look for individuals who can quickly and accurately solve arithmetic and design problems.

### **Industries That Employ Carpenters**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
152	Residential Building Construction	34.9
154	Nonresidential Building Construction	18.9
175	Carpentry and Floor Work	6.6
179	Misc. Special Trade Contractors	4.5
174	Masonry, Stonework, and Plastering	2.5
903	Local Government	2.4
806	Hospitals	2.3
653	Real Estate Agents and Managers	2.1
822	Colleges and Universities	1.8
373	Ship and Boat Building and Repairing	1.3

Most carpenters work for contractors and are involved in the construction, remodeling, and repair of buildings and other structures. Other carpenters may be employed by factories and large businesses to do maintenance and renovation work. Approximately one-third are self-employed.



## **Occupational Earnings**

A large percentage of employed carpenters are affiliated with the United Brotherhood of Carpenters and Joiners of America. Apprentices usually start at about 50 percent less wages than experienced carpenters and receive increases twice a year. Like other craft trades for the construction industry, carpenters can expect to lose work time and earnings due to inclement weather.

## **Employment Outlook**

As building and renovation continues in Massachusetts, carpenters will be sure to have a very favorable employment outlook. Employment of carpenters is expected to have an average growth. As with all construction trades the cyclical nature of the construction industry is a prime determinant in employment levels for a given occupation. Construction activity should increase in response to demand for new housing and industrial plants and the need to renovate and modernize existing structures.

Since there are no structuring requirements for carpenters many people with limited skills take jobs but eventually leave the occupation because they either dislike the work or cannot find steady employment.

Job opportunities for carpenters also vary by geographic area. Construction activity parallels the movement of people and businesses and reflects differences in local economic conditions. Therefore, the number of job opportunities in a given year may fluctuate widely from area to area.

## **Related Occupations**

Cabinet Makers

Carpenter - Finish

Boat Builder

Carpenter - Rough

## **Institutions Providing Training in Massachusetts**

Boston Center for Adult Education  
5 Commonwealth Avenue  
Boston, MA  
(617) 267-4430

North Bennet Street School  
39 North Bennet Street  
Boston, MA  
(617) 227-0155

Cambridge Center for Adult Education  
42 Brattle Street  
Cambridge, MA  
(617) 547-6789

Oficina Hispana  
125 Amory Street  
Building A  
Roxbury, MA 02119  
(617) 522-8917



Harvard University;  
Center for Life Long Learning  
Massachusetts Avenue  
Cambridge, MA  
(617) 495-4973

Home Builders Institute  
28 Millet Street  
Dorchester, MA 02124  
(617) 265-9625

Home Builders Institute  
31 North Street  
Dorchester, MA 02124  
(617) 265-9625

Minuteman Vocational Technical School  
Marrell Road  
Lexington, MA  
(617) 861-6500

*Vocational Education Programs:*

See Appendix C

**Where to Write for More Information:**

Associated Builders &  
Contractors, Inc.  
729 15th Street, N.W.  
Washington, D.C. 20005

Associated General Contractors  
of America, Inc.  
1957 E Street, N.W.  
Washington, D.C. 20006

Somerville Evening School  
81 Highland Avenue  
Somerville, MA  
(617) 625-6600

Waltham Evening School  
Waltham School Department  
Waltham, MA 02254  
(617) 893-8050

Waltham Vocational High School  
100 Summer Street  
Waltham, MA  
(617) 647-0309

Wentworth Institute of Technology  
550 Huntington Avenue  
Boston, MA 02115  
(617) 442-9010

Home Builders Institute  
Educational Arm of the National  
Association of Home Builders  
15th and M Street, N.W.  
Washington, D.C. 20005

United Brotherhood of Carpenters  
and Joiners of America  
101 Constitution Avenue, N.W.  
Washington, D.C. 20001

## Chef or Cook

Chefs and cooks are responsible for a restaurant's principal product -- the food served to the public -- and are central to its reputation and success. They develop recipes, plan menus, decide portion sizes, order ingredients, and may, depending on their own status and experience, train others in their own techniques and specialties. If a restaurant is large enough to have a staff of cooks or chefs, each one is typically responsible for one culinary specialty, such as pastry or sauces.

Chefs and cooks can be divided into three major groups -- those who work in restaurants, those who work in institutional kitchens, and those who work in either fast food or small shops. The number of cooks, job titles, and responsibilities generally depend on the size, reputation, and clientele of individual restaurants. Staffing patterns range from a cook and one or two kitchen helpers in smaller places, to more structured arrangements in large restaurants, where a head or executive chef may direct several assistant or "sous" chefs, cooks, and helpers.

Working conditions in the culinary field vary from kitchen to kitchen. Long hours of standing, lifting, and exposure to heat are often involved. Because of the sheer number of establishments competing for a place in the market, however, talented chefs are in high demand. A reputation for creativity, innovative recipes, and a quality product can mean prestige, notoriety, and career mobility for cooks and chefs.

### Education, Training, and Hiring Requirements

Whether one becomes a cook or a chef depends on the amount of formal training, skill, and experience acquired. Professional chefs complete college or culinary school programs and serve an apprenticeship. Training for cooks is offered at two- year colleges, vocational schools, and on the job. The American Culinary Federation offers apprenticeship and certification programs for both cooks and chefs. Cross-training and mastery of techniques in a variety of areas are important for career advancement.

### Industries That Employ Chefs and Cooks

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
581	Eating and Drinking Places	87.9
701	Hotels and Motels	8.3
799	Misc. Amusement, Recreation Services	1.8

## **Occupational Earnings**

Experienced chefs can earn between \$18,000 and \$40,000 per year, depending on the where they work.

## **Employment Outlook**

Moderate growth for these occupations is anticipated into the 1990s. Although institutional cooks now outnumber their restaurant and short order counterparts, opportunities in restaurants are expected to surpass those in other settings as more women work and more families eat out.

Employment of chefs and cooks is expected to increase faster than average and jobs will be plentiful because turnover is substantial. Other factors contributing to employment growth will be population growth, rising family and personal incomes, and more leisure time that will allow people to dine out and take vacations more often.

## **Related Occupations**

Baker

Food Service Directors

Pastry Chef

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Bristol Community College  
777 Elsbree Street  
Fall River, MA 02720  
(508) 678-2811

Massasoit Community College  
One Massasoit Boulevard  
Brockton, MA 02402  
(508) 588-9100

Bunker Hill Community College  
New Rutherford Avenue  
Charlestown, MA 02129  
(617) 241-8600

Newbury Junior College  
921 Boylston Street  
Boston, MA 02115  
(617) 262-9350

Essex Agricultural & Technical  
Institute  
Collegiate Division  
Route 62  
Danvers, MA 01923  
(508) 774-0050

### *Vocational Education Programs:*

See Appendix C



### **Where to Write for More Information:**

National Institute for the Foodservice  
Industry  
200 North Wacker Drive  
Suite 2620  
Chicago, IL 60606

American Culinary Federation  
P.O. Box 3466  
St. Augustine, FL 32084

National Association of Trade &  
Technical Schools  
2251 Wisconsin Avenue, N.W.  
Washington, D.C. 20007

Council on Hotel, Restaurant &  
Institutional Education  
Room S-208  
Henderson Building  
University Park, PA 16802

### **Civil Engineer**

In 1940, the population of the earth was about two billion people. By the year 2000, that population will be six billion -- a vast number of people who will need food, energy, clean water, transportation, waste disposal, health care, a safe environment, and structural facilities such as roads, bridges, dams, and power plants. These tasks will fall, as they always have, to civil engineers.

Civil engineering is the broadest of the engineering fields. Although it encompasses numerous specialties, many people think the term "civil engineer" is synonymous with "structural engineer." Structural engineers design buildings of all types. The forces that a structure must resist (weight, wind, temperature changes, earthquakes) are analyzed and the appropriate materials developed to withstand those forces. Structural engineers frequently visit the construction site and usually work with a team of architects, mechanical and electrical engineers, contractors, owners of the project, bankers, lawyers, and local government officials.

Another speciality is hydraulic engineering. These engineers deal with the physical control of water. They work on preventing floods, supplying water for irrigation, protecting beaches, controlling rivers. They build hydroelectric power plants, canals, port facilities, and offshore facilities.

Geotechnical engineers analyze the characteristics of soil and rock that support buildings, roads, and underground structures. The settling of buildings, the stability of slopes, the seepage of groundwater, and the effects of earthquakes are studied by geotechnical engineers.

Environmental engineers help to provide us with safe air, water, and land. They design systems for water treatment and distribution, air pollution control, and the containment of hazardous wastes.



Transportation engineers work closely with urban planners because the quality of life in a community depends, in great part, on the quality of the transportation system. Some transportation engineers specialize in pipeline engineering, which is the transportation of oil, gas, and other substances. This speciality requires knowledge of geotechnical and hydraulic engineering as well.

Community and urban planning are the province of construction engineers, who must possess good "people skills" as well as technical knowledge in order to be responsible for the full development of a community. Construction engineers determine street patterns, park areas, and areas for growth. With local authorities, they decide how a community will be integrated with surrounding facilities. These engineers plan each step of a construction project.

A source of great job satisfaction for all civil engineers is the fact that they make our communities better places to live and work in.

### **Education, Training, and Hiring Requirements**

People who become civil engineers are generally interested in math and science. They like to put ideas into action; they are curious about how things work and how to improve them. Civil engineers must be able to express themselves well orally and in writing, and to work as members of a team.

Generally, the entry-level requirement for civil engineers is a bachelor's degree in civil engineering. To be admitted to an undergraduate engineering school, it is desirable to take high school courses in advanced mathematics and the physical sciences.

The first two years of the college curriculum usually consist of courses in the basic sciences, introductory engineering, computer sciences, the humanities, social sciences, and English. A specialty in civil engineering is not usually chosen until the junior or senior year.

Some schools offer a five-year program that includes a cooperative study program. Periods of attending school alternate with obtaining on-the-job experience. The advantages of this type of program include the opportunities to earn part of one's tuition and to acquire work experience; co-op also provides a basis for choosing a specialty within civil engineering. Many employers view co-op experience as very desirable in a job candidate.

Though graduate training is required for faculty positions in engineering, it is not necessary for most entry-level jobs. Nevertheless, about one-third of today's civil engineering graduates go on to obtain a master's degree. Others continue their studies later while on the job, because a master's degree is often useful for learning new technology and for being promoted. In civil engineering, education never ends.

Technologies become obsolete and it is necessary to keep up with the new ones being developed.

Many employers pay for graduate study. Besides the universities, continuing education is also available through professional societies such as the American Society of Civil Engineers.

A civil engineer, perhaps more than any other kind of engineer, is directly responsible for public safety and welfare. Therefore, to use the term "professional engineer," a person must be licensed or registered. A degree from an accredited engineering school, four years of related work experience, and a passing grade on a two-part state examination are the usual requirements for registration.

Engineering graduates should take the first part of the examination and obtain an engineer-in-training (EIT) certificate soon after graduation. The second part of the exam should be taken as soon as the requirement for work experience is met.

There is also a bachelor's degree in civil engineering technology that prepares students for practical design and production work rather than for jobs that require more theoretical and mathematical knowledge. A bachelor's in civil engineering technology is a terminal degree that does not lead to a master's in engineering; technologists usually have less responsibility than engineers.

### **Industries That Employ Civil Engineers**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
891	Engineering and Architectural Services	39.7
902	State Government	24.8
903	Local Government	9.6
739	Miscellaneous Business Services	7.8
901	Federal Government	5.0
154	Nonresidential Building Construction	3.9
152	Residential Building Construction	2.6
162	Heavy Construction, Except Highway	2.2

### **Occupational Earnings**

In 1986, the average starting salary for civil engineering graduates was \$24,132.

### **Employment Outlook**

Employment of civil engineers is expected to increase faster than average through the year 2000. For a growing population and in an expanding economy, civil engineers will be needed to design and build all sorts of new structures and to repair

existing ones. Many civil engineers are employed in the construction industry, which is especially sensitive to economic slowdowns. Job opportunities there may decrease at times.

Good job prospects will exist for those interested in this occupational field. Repairing Massachusetts' infrastructure of roads, bridges, tunnels, and water and sewer systems will generate favorable opportunities for civil engineers. Additionally, the skills of civil engineers will be needed to tackle environmental problems, such as toxic waste cleanup and water pollution. The greatest number of jobs should occur in firms that provide engineering services to businesses and government.

### **Related Occupations**

Physical Scientist

Mathematician

Engineering Technician

Architect

### **Institutions Providing Training in Massachusetts**

#### *Four-Year (Bachelor's) Degree:*

Central New England College  
768 Main Street  
Worcester, MA 01610  
(508) 755-4314

Massachusetts Institute of Technology  
77 Massachusetts Avenue  
Cambridge, MA 02139  
(617) 253-4791

Merrimack College  
North Andover, MA 01845  
(508) 683-7111

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2000

Southeastern Massachusetts University  
Old Westport Road  
North Dartmouth, MA 02747  
(508) 999-8000

Tufts University  
Medford, MA 02155  
(617) 628-5000

University of Lowell  
One University Avenue  
Lowell, MA 01854  
(508) 452-5000

University of Massachusetts-  
Amherst  
Amherst, MA 01003  
(413) 545-0111

Wentworth Institute of Technology  
550 Huntington Avenue  
Boston, MA 02115  
(617) 442-9010

Worcester Polytechnic Institute  
Worcester, MA 01609  
(508) 793-5000



**Where to Write for More Information:**

American Society of Civil  
Engineers  
345 E. 47th Street  
New York, NY 10017

**Civil Engineering Technician**

Usually graduates of two-year schools, these technicians help civil engineers on construction projects such as buildings, dams, bridges, highways, and wastewater treatment systems. Technicians' jobs are more limited in scope and more practically oriented than those of engineers. For example, a technician may perform soil tests or examine a foundation. Another technician may perform basic calculations involving quantities of materials, estimate construction costs, or specify materials to be used in a project. Some technicians inspect water treatment systems to make sure that pollution control standards are met.

**Education, Training, and Hiring Requirements**

Most employers prefer applicants with technical training, which may be obtained at a variety of institutions including technical institutes, junior and community colleges, and vocational-technical schools. These programs may differ greatly in kind and quality; a prospective student must therefore be careful. It is helpful to ask employers about their preferences and to ask schools about the kinds of jobs obtained by graduates, instructional facilities and equipment, and faculty qualifications.

It is also possible to qualify for some technician jobs in other ways -- by taking college courses in engineering and mathematics, by obtaining on-the-job experience, by going through an apprenticeship program, or by acquiring training and experience in the Armed Forces. Additional specialized training and experience, however, are often necessary to become a technician.

Applicants need an aptitude for mathematics and science and should take as many of those courses as possible in high school. Because technicians often work as members of a team, they should be able to work well with others.



## Industries That Employ Civil Engineering Technicians

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
739	Miscellaneous Business Services	42.0
891	Engineering and Architectural Services	36.5
154	Nonresidential Building Construction	8.9
903	Local Government	6.0
491	Electric Services	4.5

## Occupational Earnings

For all full-time engineering technicians (civil, electrical, electronics, industrial, and mechanical), the median annual earnings were about \$24,400 in 1986.

## Employment Outlook

Growth much faster than average is expected for engineering technicians through the year 2000.

Employment in this field is expected to grow much faster than average due to anticipated increases in research and development expenditures and the continued rapid growth in the output of technical products. In addition, competitive pressures and advancing technology will force companies to improve and update manufacturing facilities and product designs more rapidly than in the past.

## Related Occupations

Science Technician

Drafter

Surveyor

Health Technologist or  
Technician

## Institutions Providing Training in Massachusetts

### *Two-Year (Associate's) Degree:*

Bristol Community College  
777 Elsbree Street  
Fall River, MA 02720  
(508) 678-2811

Massasoit Community College  
One Massasoit Boulevard  
Brockton, MA 02402  
(508) 588-9100

Central New England College  
Worcester Junior College  
768 Main Street  
Worcester, MA 01610  
(508) 755-4313

Springfield Technical Community  
College  
Armory Square  
Springfield, MA 01105  
(413) 781-7822

Franklin Institute of Boston  
41 Berkeley Street  
Boston, MA 02116  
(617) 423-4630

Wentworth Institute of Technology  
550 Huntington Avenue  
Boston, MA 02115  
(617) 442-9010

Massasoit Community College  
The Technical Institute at Blue Hills  
100 Randolph Street  
Canton, MA 02021  
(617) 828-5800

#### **Where to Write for More Information:**

Jets Inc.  
345 East 47th Street  
New York, NY 10017

### **Claims Clerk**

Claims clerks work for large fire, marine, and casualty insurance companies; small agencies; the federal government; and, to a lesser extent, life insurance companies. They process initial claims forms for policy holders who call to report damage or loss. Job duties generally are divided among telephoning, receiving accident reports, contacting police departments and doctors' offices, and preparing the insurance forms which accompany each type of claim.

Like many other clerical occupations, the claims clerk position has changed dramatically since computers were introduced into the workplace. At one time, clerks made extensive use of written manuals to obtain cost estimate figures and other information. Today a clerk can type the name of a damaged part into a computer that makes the required calculation instantly.

Claims clerks represent their companies to the insured, collect information, explain procedures, and occasionally help with a claim settlement. The occupation requires effective communication and telephone skills and typing ability. Promotional opportunities may include claims teleprocessor and claims automation technician,

depending on the titles used by the company. Large insurance companies often use clerk positions as a port of entry for more advanced jobs. Many offer attractive tuition assistance plans for employees who wish to continue their education.

### **Education, Training, and Hiring Requirements**

Employers often require a high school degree or the equivalent for this position. Employees can demonstrate an interest in insurance by enrolling in in-house courses on topics such as rating different lines of insurance and increase their chances for internal promotion.

### **Industries That Employ Claims Clerks**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
641	Insurance Agents, Brokers & Services	31.9
633	Fire, Marine, and Casualty Insurance	22.9
631	Life Insurance	22.3
901	Federal Government	16.4
632	Medical Service and Health Insurance	4.5

### **Occupational Earnings**

Insurance clerks in general earn between \$200 and \$250 a week, with experienced workers earning between \$300 and \$325. Insurance industry employees generally receive liberal benefit packages.

### **Employment Outlook**

Continued growth in insurance should contribute to modest expansion in this occupation. In 1984 there were 2,430 claims clerks employed in Massachusetts firms. The category is expected to grow by approximately 20 percent by 1995.

### **Related Occupations**

Insurance Clerk

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Aquinas Junior College  
15 Walnut Park  
Newton, MA 02158  
(617) 244-8134

Newbury College  
129 Fisher Street  
Brookline, MA  
(617) 739-0510

Bristol Community College  
777 Elsbree Street  
Fall River, MA 02720  
(508) 678-2811

Newbury Junior College  
921 Boylston Street  
Boston, MA 02115  
(617) 262-9350

Bunker Hill Community College  
New Rutherford Avenue  
Charlestown, MA 02129  
(617) 241-8600

North Shore Community College  
3 Essex Street  
Beverly, MA 01915  
(508) 927-4850

Cape Cod Community College  
Route 132  
West Barnstable, MA 02668  
(508) 362-2131

Professional School of Insurance  
61 Traveler Lane  
Marshfield, MA 02050  
(617) 834-7743

Lasell Junior College  
College  
1844 Commonwealth Avenue  
Newton, MA 02166  
(617) 243-2225

Springfield Technical Community  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

## **Commercial Artist**

Commercial art is concerned with the design and execution of artwork that promotes public consumption of goods and services. Commercial or graphic artists can be either designers or illustrators or both. They may work in art departments within large organizations such as retail department stores, in advertising agencies and design firms, in corporate communications offices, for magazines and newspapers, or for paper producers. Many freelance as either medical or technical illustrators. Artists and designers create the labels, advertisements, logos, catalogs, covers, posters, and packaging for the products people use every day. Since art is an effective means for influencing public opinion, commercial artists and designers are essential for the



production of effective business communications, reports, newsletters, promotional flyers, school catalogs, fundraising appeals, and political campaign literature.

In preparing material for a client, artists and designers consider factors such as intended use, budget, client preferences, style, techniques, and production methods. In executing a project, an artist will frequently develop an idea or concept, collect relevant materials such as photographs and text, prepare the layout, and present it to the client before final production. Designers generally use photographs, type styles, inks, and paper to produce a desired effect, while illustrators generally produce original artwork.

### **Education, Training, and Hiring Requirements**

There are approximately 5,300 jobs in commercial art in Massachusetts. The largest employers are direct mail and catalog producers. Advertising is the second largest source of jobs for commercial artists in the state.

Entry-level positions for artists are highly competitive in advertising. Many artists enter the field either from an art department at one of the large businesses in Boston or from within the clerical ranks of the ad agency. A good portfolio is essential to obtaining a job in commercial art. It can be developed in school from class assignments, school projects, and extracurricular activities, and improved with examples of freelance or professional work after graduation.

Talent and creativity are important assets in commercial art. Within advertising, for example, promotions from the assistant art director level typically require innovative presentations and assignments on progressively important accounts. The atmosphere in most agencies is highly competitive and the hours are frequently very long.

Art school, preferably one with a four-year curriculum, provides some of the best preparation for a professional career in commercial art. While it is possible to obtain a job as a layout or pasteup artist at a magazine or local newspaper with a two-year associate's degree, additional education and training are important for advancement in the field.

## Industries That Employ Commercial Artists

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
731	Advertising	16.5
733	Mailing, Reproduction, Stenographic	14.1
271	Newspapers	9.8
899	Miscellaneous Services	7.4
739	Miscellaneous Business Services	6.6
736	Personnel Supply Services	6.3
275	Commercial Printing	5.5
531	Department Stores	4.2
892	Noncommercial Educational Services	3.0

## Occupational Earnings

The typical starting pay for assistant art directors in the Boston area is \$15,000 to \$16,000.

## Employment Outlook

Better than average growth is expected through 1995. Much of this growth will be fueled by continued expansion in business services, banking, and finance. As businesses continue to offer new products, communicate more with customers, attract the attention of new markets, and distinguish themselves from their competitors, they will require the services of advertising agencies and graphic design firms. The rise in the number of families with two working parents has created a greater demand for the catalog and shop-by-mail services which employ large numbers of designers and illustrators.

Employment of graphic artists is expected to grow faster than average as producers of information, goods, and services put even more emphasis on visual appeal in product design, advertising and marketing. Many new jobs will be created in advertising agencies and graphic arts studios.

Although formal training at either a two or four year postsecondary art school is extremely advantageous, there are few formal entry requirements. As a result competition for jobs is keen and to succeed one must display outstanding talent, creativity, and style.

## Related Occupations

Graphic Designer  
Layout Artist

Fashion Illustrator  
Package Designer

## **Institutions Providing Training in Massachusetts**

### *Four-Year (Bachelor's) Degree:*

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2300

Salem State College  
352 Lafayette Street  
Salem, MA 01970  
(508) 745-0556

Hampshire College  
Amherst, MA 01002  
(413) 549-4600

School of the Museum of Fine Arts  
230 The Fenway  
Boston, MA 02115  
(617) 267-1218

Massachusetts College of Art  
621 Huntington Avenue  
Boston, MA 02115  
(617) 232-1555

Swain School of Design  
19 Hawthorn Street  
New Bedford, MA 02740  
(508) 997-7831

### **Where to Write for More Information:**

Society of American Florists  
901 North Washington Street  
Alexandria, VA 22314

The Graphic Artists' Guild  
30 East 20th Street, Room 405  
New York, NY 10003

Industrial Designers' Society  
of America  
1360 Beverly Road, Suite 303  
McLean, VA 22101

The National Art Education  
Association  
1916 Association Drive  
Reston, VA 22091

International Association of  
Clothing Designers  
450 Seventh Avenue, Suite 811  
New York, NY 10123

The America Institute of  
Visual Arts  
1059 3rd Avenue  
New York, NY 10021



## Computer Programmer

Computer programmers write detailed instructions, called programs that enable computers to carry out specific tasks or functions. Working from sketches or specifications provided by systems analysts, programmers combine their knowledge of computer technology, mathematics, and logic to develop step-by-step instructions for handling data, operating machinery, or performing other complex tasks using computers. These instructions are encoded in a computer language, such as COBOL, BASIC, or Pascal, developed for specific business or scientific applications. Programmers may use these existing languages to develop, test, and "debug" new programs or to improve the operation of existing ones. Highly skilled individuals may work on the development of new languages. Simple programs can be created in a matter of a few hours; complex programs and new computer language can require years of effort. In addition to writing codes and designing improvements, computer programmers write documentation to describe the development process and prepare written instructions for the computer operators who will eventually run the programs. Although many programmers work in conjunction with systems analysts, they are sometimes expected to function as programmer/analysts who are capable of providing both the analysis and finished product.

Computer programmers work in a variety of settings, from computer and data processing services and high technology to insurance companies and universities. Positions can be found in software development houses, telecommunications firms, hospitals, financial institutions, and any other organization that supports or uses computers. Like the work of systems analysts, the functions and responsibilities of computer programmers vary with the industries and organizations that employ them.

Programming positions are grouped into two categories: applications programming and systems programming. Applications programmers are generally employed in business, engineering, or science. They write software (programs) to achieve specific purposes; for example, to process payroll, to control a robot on the manufacturing floor, or to analyze data. In business organizations, programmers can be found in large data processing departments or, like systems analysts, may be assigned to support an area such as accounting or marketing. In engineering, programmers may work in groups or as part of a team composed of engineers, technicians, analysts, and programmers. Scientific applications programmers often work in research and development environments, where groups of programmers work together on complex problems.

Systems programmers develop and maintain the software that controls the operation of the computer itself. They work for computer manufacturers, system



software developers, and organizations that use large, complex computer systems, such as government research installations. They can work individually or as part of development, testing, or quality control teams.

### **Education, Training, and Hiring Requirements**

Although the educational requirements for entry-level programming opportunities vary widely, most employers prefer candidates who have had formal training, experience, or both. While associate's degree graduates can find attractive entry-level opportunities, business applications programming increasingly requires a four-year degree as well as a solid background in programming languages. Jobs in scientific applications programming usually require a bachelor's degree in mathematics or a related discipline. Systems programming, which is considered more complex, usually requires a four-year degree in computer science, math, or physics.

### **Industries That Employ Computer Programmers**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
737	Computer and Data Processing Services	31.2
739	Miscellaneous Business Services	9.9
631	Life Insurance	9.0
357	Computer and Office Equipment	8.2
822	Colleges and Universities	3.8
367	Electronic Components and Accessories	2.5
508	Machinery, Equipment, and Supplies	2.4
366	Communication Equipment	2.1
892	Noncommercial Educational Services	1.8
481	Telephone Communication	1.6

### **Occupational Earnings**

Entry-level salaries for computer programmers vary according to industry, organization, specialty, and educational preparation. Generally speaking, starting salaries in Massachusetts high technology industries are somewhat higher than those in the business sector. Salaries for new programmers in manufacturing range from \$17,316 to \$23,400, and experienced programmers can earn as much as \$35,880. In service industries, starting salaries range from \$15,600 to \$21,000 and rise to as high as \$36,500 for experienced workers.

## **Employment Outlook**

Despite the increased use of personal computers, the computer programming field is expected to continue to grow at a better-than-average rate, from 15,800 jobs in 1984 to 27,650 jobs in 1995. New developments in software design, computer chip technology and personal computers, however, may have a negative effect on the demand for programmers. The growth rate for systems analysts is expected to be slightly higher, at 81 percent, because of their perceived ability to help others adjust to changes in the technology. Among programmers, job prospects are predicted to be best for graduates who have a variety of programming languages, formal educational preparation, and some job experience.

Employment of computer programmers is expected to grow much faster than average as computer usage expands. The need for programmers will increase as businesses, government, schools, and scientific organizations seek new applications for computers and improve the software already in use.

Job prospects will be best for college graduates who majored in computer science or a related area and have experience or training in fields such as accounting, management, engineering, or science. Applicants with less than a bachelor's degree and no experience are likely to face strong competition.

## **Related Occupations**

Programmer, Business  
Software Technician

Programmer, Engineering and  
Scientific

## **Institutions Providing Training in Massachusetts**

### *Four-Year (Bachelor's) Degree:*

Anna Maria College  
Sunset Lane  
Paxton, MA 01612  
(508) 757-4586

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2300

Gordon College  
255 Grapevine Road  
Wenham, MA 01984  
(508) 927-2300

Hampshire College  
Amherst, MA 01002  
(413) 549-4600

North Adams State College  
Church Street  
North Adams, MA 01247  
(413) 664-4511

Salem State College  
352 Lafayette Street  
Salem, MA 01970  
(508) 745-0556

*Two-Year (Associate's) Degree:*

Becker Junior College--Worcester  
61 Sever Street  
Worcester, MA 01609  
(508) 791-9241

Bristol Community College  
777 Elsbree Street  
Fall River, MA 02720  
(508) 678-2811

Bunker Hill Community College  
New Rutherford Avenue  
Charlestown, MA 02129  
(617) 241-8600

Central New England College of  
Technology  
Worcester Junior College  
768 Main Street  
Worcester, MA 01610  
(508) 755-4314

Chamberlayne Junior College  
128 Commonwealth Avenue  
Boston, MA 02116  
(617) 536-4500

Endicott College  
376 Hale Street  
Beverly, MA 01915  
(508) 927-0585

Fisher Junior College  
118 Beacon Street  
Boston, MA 02116  
(617) 262-3240

Franklin Institute of Boston  
41 Berkeley Street  
Boston, MA 02116  
(617) 423-4635

Mount Ida Junior College  
777 Dedham Street  
Newton Centre, MA 02159  
(617) 969-7000

Mount Wachusett Community  
College  
444 Green Street  
Gardner, MA 01440  
(508) 632-6600

Newbury Junior College  
921 Boylston Street  
Boston, MA 02115  
(617) 262-9350

North Shore Community  
College  
3 Essex Street  
Beverly, MA 01915  
(508) 927-4850

Northern Essex Community  
College  
100 Elliott Street  
Haverhill, MA 01830  
(617) 374-0721

Quincy Junior College  
34 Coddington Street  
Quincy, MA 02169  
(617) 786-8799

Quinsigamond Community  
College  
670 West Boylston Street  
Worcester, MA 01606  
(508) 853-2300

Roxbury Community College  
625 Huntington Avenue  
Boston, MA 02115  
(617) 734-1960



Massasoit Community College  
The Technical Institute at  
Blue Hills  
100 Randolph Street  
Canton, MA 02021  
(617) 828-5800

Springfield Technical  
Community College  
Armory Square  
Springfield, MA 01105  
(413) 781-7822

Massasoit Community College  
One Massasoit Boulevard  
Brockton, MA 02402  
(508) 588-9100

Wentworth Institute of  
Technology  
550 Huntington Avenue  
Boston, MA 02115  
(617) 442-9010

Middlesex Community College  
Springs Road  
Bedford, MA 01730  
(617) 275-8910

#### **Where to Write for More Information:**

Data Processing Management  
Association  
505 Busse Highway  
Chicago, IL 60068

### **Computer Systems Analyst**

Systems analysts help people use computers to solve problems. In the fields of business, education, science, and engineering, a systems analyst is the link between the user, who has an information-related problem, and the computer programmer, who gives the computer the instructions for solving that problem.

Systems analysts often work in groups in data processing departments inside large organizations. In manufacturing firms, insurance companies, and other business enterprises, they may be assigned to support functional areas like accounting, research, or engineering. As private consultants employed in the business services industry, they may work individually or in teams in the field on behalf of their clients.

Systems analysts design ways to help managers, scientists, and other professionals automate manual processes or improve the work already being done by computers. Analysts prepare detailed specifications which describe the flow of information from the source to the computer and define the process the computer will use to rearrange the data into usable form. Analysts work with various levels of



personnel and managers to design procedures for storing and manipulating data and for formatting reports or output. They also recommend appropriate hardware (equipment) and software (computer programs) to accomplish given tasks; determine costs and personnel requirements; and implement, test, and adjust new systems and programs, often in conjunction with computer programmers.

A systems analyst must be able to assess the needs of a particular business or department and determine the best application of available technology. An analyst, therefore, needs a background in a particular business field and in technical software. In some settings, systems analysts design the processes but do little of the actual programming, that is, writing the step-by-step instructions that computers understand. Some employers prefer to hire analyst/programmers who can do both. In most cases, however, systems analysts are expected to have a working knowledge of one or more computer languages like COBOL, Fortran, or Pascal and to be familiar with some of the more common software packages for word processing, financial reporting, and database management.

### **Education, Training, and Hiring Requirements**

The educational prerequisites for this occupation vary according to industry. Candidates for entry-level positions in scientific or high technology environments often need a bachelor's degree in computer science, engineering, mathematics, or physics. Business opportunities may require a four-year degree in accounting or finance with coursework in business computing or a degree in management information science.

Because the systems analyst is a fact-gatherer and an interpreter, strong verbal and written communication skills are essential for success in the field. Consulting work and computer applications for education, medicine, or research may provide good opportunities for liberal arts graduates who have strong computer backgrounds. Many employers use a computer aptitude test as part of the hiring process to determine the degree of technical ability among applicants. These employers may place less emphasis on a particular undergraduate degree than on the actual competence of computer-literate candidates.

In addition to computer science, courses in complex organizations, communication, writing, and economics are important for those planning to enter this field. Cooperative education and internship experience in software application or the instruction of end users can be extremely valuable credentials.

## Industries That Employ Systems Analysts

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
737	Computer and Data Processing Services	28.1
357	Computer and Office Equipment	8.0
631	Life Insurance	5.8
822	Colleges and Universities	5.3
602	Commercial Banks	5.2
739	Miscellaneous Business Services	5.0
367	Electronic Components and Accessories	3.1
481	Telephone Communications	2.7
901	Federal Government	2.5
902	State Government	2.4

In Massachusetts, one-quarter of all systems analysts work for computer and data processing services. Another 20 percent work for high technology firms in computer manufacturing or electronics. The remainder are located in industries across the economy, including financial services, banking, education, health care, retail sales, and research and development.

Positions in systems analysis have a number of names. For example, one of the largest public accounting firms in Boston hires over one hundred new "systems consultants" each year. These consultants provide many of the same services as in-house systems analysts on a fee-for-service basis. Another title used at the entry level is information systems trainee. Although most jobs of this kind are concentrated in urban areas and along suburban highways like Routes 128 and 495, the diversity of establishments which hire systems analysts makes it possible to find attractive positions in many parts of the state.

## Occupational Earnings

Entry-level salaries for systems analysts vary according to industry and organization. Bachelor's degree graduates can earn between \$19,000 and \$27,000 to start. Where master's degrees are preferred, starting salaries may be higher. Duties and responsibilities vary widely as well. Some new hires may begin with programming or with responsibility for carrying out discrete, routine tasks. Once they acquire sufficient organizational and managerial expertise, they can take on more challenging assignments and eventually move into senior analyst and unit manager positions. Senior analysts, who may supervise staff and handle larger and more complex systems problems, can earn as much as \$47,000 a year.

## **Employment Outlook**

One of the strengths of the systems analyst occupation is the fact that it spans a number of growth industries in Massachusetts. For example, computer and data processing services is one of the fastest growing businesses in the state. Growth in this area has been, and continues to be, driven by the demand for personal computers and the customized business software to run them. Many companies under pressure to remain lean and competitive have found it less expensive to hire outside consultants to design new systems and install software rather than to maintain a staff of programmers and analysts in-house. Computer consulting services are offered by traditional business service providers, like the "Big Eight" accounting firms, and by smaller entrepreneurial firms that specialize in particular computer applications such as database development.

Despite slower growth in high technology in recent years, experts still anticipate that those industries will produce a quarter of all new jobs in Massachusetts through 1995. Computer manufacturers, electronics producers, and related firms will remain a good source of jobs for systems analysts. Across the economy, most organizations which maintain large computer operations will continue to hire analysts and programmers. Jobs will be available in health maintenance organizations and hospitals, universities, insurance companies, banks, government agencies, department stores, and research organizations.

The overall growth rate for the occupation between 1984 and 1995 is expected to be 8 percent, slightly higher than that expected for computer programmers.

Employment of systems analysts is expected to grow much faster than average as advances in technology lead to new applications for computers. Factory and office automation, advances in telecommunications, technology, and scientific research are just a few areas where use of computer systems will expand.

Job prospects will be best for college graduates who combine courses in programming and systems analysis with training and experience in applied fields.)

## **Related Occupations**

Computer Programmer  
Applications Programmer  
Systems Programmer

Systems Consultant  
Management Information  
Systems Consultant



## **Institutions Providing Training in Massachusetts**

### *Four-Year (Bachelor's) Degree:*

American International College  
1000 State Street  
Springfield, MA 01109  
(413) 737-7000

Amherst College  
Amherst, MA 01002  
(413) 542-2328

Anna Maria College  
Sunset Lane  
Paxton, MA 01612  
(508) 757-4586

Assumption College  
500 Salisbury Street  
Worcester, MA 01609  
(508) 752-5615

Atlantic Union College  
South Lancaster, MA 01561  
(508) 365-4561

Babson College  
Babson Park  
Wellesley, MA 02157  
(617) 235-1200

Bentley College  
Beaver and Forest Streets  
Waltham, MA 02254  
(617) 891-2244

Boston College  
Lyons Hall 120  
Chestnut Hill, MA 02167  
(617) 552-3100

Nichols College  
Dudley, MA 01570  
(508) 943-2055

North Adams State College  
Church Street  
North Adams, MA 01247  
(413) 664-4511

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2200

Salem State College  
352 Lafayette Street  
Salem, MA 01970  
(508) 745-0556

Simmons College  
300 The Fenway  
Boston, MA 02115  
(617) 738-2107

Smith College  
Northampton, MA 01063  
(413) 584-0515

Southeastern Massachusetts  
University  
Old Westport Road  
North Dartmouth, MA 02747  
(508) 999-8605

Springfield College  
263 Alden Street  
Springfield, MA 01109  
(413) 788-3136



Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2300

Brandeis University  
415 South Street  
Waltham, MA 02254  
(617) 647-2878

Bridgewater State College  
Tillinghast Hall  
Bridgewater, MA 02324  
(508) 697-1237

Central New England College of  
Technology  
768 Main Street  
Worcester, MA 01610  
(508) 755-4314

Clark University  
950 Main Street  
Worcester, MA 01610  
(508) 793-7431

Eastern Nazarene College  
23 East Elm Avenue  
Wollaston, MA 02170  
(617) 773-2373

Fitchburg State College  
160 Pearl Street  
Fitchburg, MA 01420  
(508) 345-2151

Framingham State College  
100 State Street  
Framingham, MA 01701  
(508) 620-1220

Stonehill College  
Washington Street  
North Easton, MA 02356  
(508) 238-1081

Suffolk University  
Beacon Hill  
Boston, MA 02108  
(617) 723-4700

Tufts University  
Medford, MA 02155  
(617) 381-3170

University of Lowell  
One University Avenue  
Lowell, MA 01854  
(508) 452-5000

University of Massachusetts--  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222

University of Massachusetts--Boston  
Harbor Campus  
Boston, MA 02125  
(617) 929-7102

Wellesley College  
Wellesley, MA 02181  
(617) 235-0320

Wentworth Institute of Technology  
550 Huntington Avenue  
Boston, MA 02115  
(617) 442-9010

Western New England College  
1215 Wilbraham Road  
Springfield, MA 01119  
(413) 782-3111

Gordon College  
255 Grapevine Road  
Wenham, MA 01984  
(508) 927-2300

Hampshire College  
Amherst, MA 01002  
(413) 549-4600

Harvard and Radcliffe Colleges  
Byerly Hall  
8 Garden Street  
Cambridge, MA 02138  
(617) 495-1551

Massachusetts Institute of  
Technology  
77 Massachusetts Avenue  
Cambridge, MA 02139  
(617) 253-4791

Merrimack College  
North Andover, MA 01845  
(508) 683-7111

Westfield State College  
Western Avenue  
Westfield, MA 01085  
(413) 568-331

Williams College  
P.O. Box 487  
Williamstown, MA  
(413) 597-2211

Worcester Polytechnic Institute  
Worcester, MA 01609  
(508) 793-5286

Worcester State College  
486 Chandler Street  
Worcester, MA 01602  
(508) 793-8040

**Where to Write for More Information:**

Association for Systems Management  
24587 Bagley Road  
Cleveland, OH 44138

Data Processing Management  
Association  
505 Busse Highway  
Park Ridge, IL 60068

## Cost Estimator

Cost estimators work in construction and manufacturing trades, where they develop cost predictions for future projects. These figures are then used by owners and managers as guidelines for bidding on contracts or for determining the profitability of new products and services.

Cost estimators compile and analyze data on all the factors that may possibly influence costs: materials, labor, location, and special machinery. Complex formulas and calculations are sometimes used to derive the most accurate estimates. Computers, which are used increasingly in the estimating process to perform routine, repetitive, and time-consuming calculations, allow estimators to spend more time on project analysis.

Cost estimating for construction and manufacturing firms are two very different jobs. On a large, new construction project, the first step is to prepare an estimate, with the intention of submitting a bid. After reviewing architect's drawings, engineering specifications, and other documents, the estimator arranges a visit to the proposed construction site to gather additional information. Drainage, surface topography, and access to utility services all affect the cost of completing the job. This information is most often contained in a signed report included with the project estimate package.

Some estimators specialize in particular aspects of a construction job. For example, firms doing plumbing or electrical contracting will send in an estimator who has a background in those trades and who can produce reliable cost estimates.

After gaining an understanding of the scope of a project, an estimator must determine the quantity and quality of materials and manpower needed to complete the project. This process, called the quantity survey, or "takeoff," is completed by filling out standard forms that detail the dimensions, number of units, cost of labor, equipment, subcontracts, overhead, taxes, insurance, markup, and any other costs that may affect the project. After completion of the quantity surveys, the chief estimator prepares a total project cost summary. A bid proposal is then readied for submission.

Cost estimators in manufacturing firms are generally employed in the manufacturing engineering department. Their job typically begins with a request to estimate the costs of producing a new product or design. In collaboration with the engineering staff, an estimator reviews blueprints to determine the specific machining operations and the equipment, including tools, gauges, and materials, that are required for production.

The second step in this operation is the preparation of a parts list. If the parts are to be manufactured in-house, the most efficient method must be ascertained. If the



parts must be purchased, the estimator contacts potential suppliers and requests their price lists.

The next job for the cost estimator is the preparation of time charts and learning curves. Time charts estimate the amount of time that will be necessary to manufacture, assemble, and test the individual parts, as well as the final product. Commonly called "problem curves," learning curves address such problems as engineering changes, parts shortages, and operator skills -- in short, the process of debugging production.

Estimators spend the greater portion of their time working in an office, but construction estimators make frequent trips to construction sites. Likewise, manufacturing estimators spend time on the factory floor while observing production.

Cost estimators often operate under great stress, especially while involved in competitive bidding on major contracts. There is always a certain level of pressure because any mistake or miscalculation can cause a firm to be eliminated from contention for a profitable contract. Conversely, an inaccurate low estimate may encourage a company to take on a job that ultimately proves unprofitable.

### **Education, Training, and Hiring Requirements**

Potential cost estimators may prepare for the occupation in various ways. In construction, employers prefer that applicants have a thorough knowledge of construction materials, costs, and procedures in areas ranging from heavy construction to electrical work, plumbing systems, and masonry work. Most estimators have previous experience as contractors or skilled crafts workers. Those that can combine this type of experience with postsecondary training in construction estimating or civil engineering are considered well qualified for this field. Regardless of background, estimators receive much training on the job, usually by working closely with an experienced estimator.

Successful cost estimators must have an aptitude for mathematics and must be able to analyze, compare, and interpret data quickly and accurately. Clear and concise writing skills are needed to prepare reports.

Advancement in the cost estimating field consists mainly of achieving higher pay, gaining more responsibility, and acquiring increased prestige. The American Society of Professional Estimators is developing a certification program to establish minimum occupational standards. Professional recognition through this type of certification is very valuable. It means that an estimator has shown competence, has between three and seven years' experience, and has passed a written and oral examination.



## Industries That Employ Cost Estimators

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
154	Nonresidential Building Contractors	15.3
891	Engineering and Architectural Services	10.1
173	Electrical Work	7.9
179	Miscellaneous Special Trade Contractors	7.6
174	Masonry, Stonework, and Plastering	6.2
152	Residential Building Contractors	6.0
176	Roofing, Siding and Sheet Metal Work	5.0
171	Plumbing, Heating, Air-Conditioning	4.0
162	Heavy Construction, Except Highway	4.0
383	Optical Instruments and Lenses	3.3

## Occupational Earnings

Salaries vary greatly according to experience, education, size of firm, and industry. Average starting salaries are between \$15,000 and \$25,000. Those with certification and several years of experience earn between \$30,000 and \$80,000.

## Employment Outlook

Most future job openings will result from the need to replace cost estimators who have changed fields or retired. Cost estimating is an occupation strongly dependent on the level of construction and manufacturing activity. The planned projects to repair the infrastructure of Massachusetts should provide some strong job opportunities for cost estimators. In addition, government contracts now require thorough and comprehensive proposals. Due to these stringent regulations, cost estimators in manufacturing industries may find their role becoming increasingly important.

## Related Occupations

Accountant	Engineer
Actuary	Mathematician
Bank Officer	

## **Institutions Providing Training in Massachusetts**

### *Four-Year (Bachelor's) Degree, Business Economics:*

Assumption College  
500 Salisbury Street  
Worcester, MA 01609  
(508) 752-5615

North Adams State College  
Church Street  
North Adams, MA 01247  
(413) 664-4511

Bentley College  
Beaver and Forest Streets  
Waltham, MA 02254  
(617) 891-2244

Salem State College  
352 Lafayette Street  
Salem, MA 01970  
(508) 745-0556

Boston College  
Lyons Hall 120  
Chestnut Hill, MA 02167  
(617) 552-3150

University of Lowell  
One University Avenue  
Lowell, MA 01854  
(508) 452-5000

Massachusetts Institute of Technology  
77 Massachusetts Avenue  
Cambridge, MA 02139  
(617) 253-4791

University of Massachusetts--  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222

Merrimack College  
North Andover, MA 01845  
(508) 683-7111

Western New England College  
1215 Wilbraham Road  
Springfield, MA 01119  
(413) 782-3111

Nichols College  
Dudley, MA 01570  
(508) 943-2055

## **Drafter**

Drafters prepare detailed working drawings and layouts of designs and construction. These drawings, which translate the rough sketches, specifications, and calculations developed by scientists, engineers, architects, and designers, contain the exact dimensions and specifications of a design and each of its separate parts. Drafters must be able to translate complex concepts into clear and understandable designs. Their drawings contain symbols which are uniform throughout the trade. Drafters also prepare the documentation that accompanies any design, such as information about specifications and materials.

Drawings may be prepared using either of two distinct methods. In the traditional method, drafters sit at a drawing board and use compasses, dividers, protractors, triangles, and other drafting devices to manually prepare a drawing. Drafters also use technical handbooks, tables, and calculators in preparing their work. Proponents of this method claim that manual drafting has a signature and a character of its own.

Increasingly, drafters are using computers with computer-aided design (CAD) software systems. CAD joins the power of the computer with the creativity and skills of the drafter. Most systems offer four basic functions that greatly enhance productivity: replication, which takes part of an image and uses it in other areas when a drawing has repetitive features; translation, which transfers details from one part of the screen to another; scaling, which changes the size of one part of a design in relation to another; and rotation, which rotates a design on the screen so that it can be examined from different angles and perspectives.

Computer-aided designing is both neater and faster than board drawing. When drafters work on a CAD system, the drawings are stored in a central database and may easily be recalled for changes or modification. Stored designs often serve as the basis for more complex applications. Projects may sometimes be added to by slightly altering drawings already in the computer instead of by starting the entire design process from scratch. Despite the advantages offered by CAD systems, currently most drafting is still being done by traditional methods.

### **Education, Training, and Hiring Requirements**

Graduation from a two-year post-secondary program is strongly preferred. Training is usually offered through technical institutes, junior and community colleges, and extension divisions of universities. Some drafters learn the trade while in the armed services.

Programs should offer students the opportunity to develop "hands-on" designing skills. Training should include courses in mathematics and the physical sciences, as well as mechanical drawing and drafting. Knowledge of manufacturing or construction methods is also very helpful. Although CAD systems are used with increasing frequency in the field, drafters still must obtain a thorough grounding in the basics of manual drafting so that they can make effective use of the new technologies available.

Neatness, strong mathematical skills, talent and interest in drawing, and the ability to pay close attention to detail are top qualities for drafters. Drafters also need good eyesight and manual dexterity.



## Industries That Employ Drafters

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
891	Engineering and Architectural Services	25.5
367	Electronic Components and Accessories	7.6
736	Personnel Supply Services	6.9
366	Communication Equipment	5.9
357	Computer and Office Equipment	5.2
354	Metalworking Machinery	3.9
382	Measuring and Controlling Devices	3.4
274	Miscellaneous Publishing	2.9
386	Photographic Equipment and Supplies	2.5
355	Special Industry Machinery	2.3

## Occupational Earnings

The median annual income of drafters in 1986 was \$21,400. Beginning drafters in private industry averaged about \$13,054.

## Employment Outlook

Employment should increase slightly through the year 2000. Industrial growth associated with new products and processes will be offset to some degree by the widespread uses of CAD, which increases drafting production and therefore may limit the need for additional drafters.

## Related Occupations

Integrated Circuit Layout Designer  
Engineering Assistant

Die Designer

## Institutions Providing Training in Massachusetts

### *Two-Year (Associate's) Degree:*

Franklin Institute of Boston  
41 Berkeley Street  
Boston, MA 02116  
(617) 423-4635

Roxbury Community College  
625 Huntington Avenue  
Boston, MA 02115  
(617) 734-1960



Massasoit Community College  
The Technical Institute of Blue Hills  
100 Randolph Street  
Canton, MA 02021  
(617) 828-5800

Springfield Technical Community  
Community  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

Massasoit Community College  
One Massasoit Boulevard  
Brockton, MA 02402  
(508) 588-9100

Wentworth Institute of Technology  
550 Huntington Avenue  
Boston, MA 02115  
(617) 442-9010

### *Vocational Education Programs:*

See Appendix C

## **Drywall Installer**

Drywall gypsum panels were developed after World War II as both an economical and time-saving substitute for wet plaster. Each drywall panel consists of a thin layer of plaster sandwiched between two pieces of heavy paper. Panels are manufactured in standard sizes and may require alterations before they can be installed. Drywalls quickly gained popularity and are now used in almost all new construction projects and in remodeling older structures.

The development of this material has created new jobs dealing with its installation. Drywall installers measure and cut standard-sized (that is, four- by twelve-foot) panels to fit around doors and windows. Installers also cut holes to allow for electric outlets, air-conditioning units, and plumbing. Because drywalls are heavy and cumbersome, an assistant usually helps the installer to position and secure the panels.

Some installers specialize in hanging drywall panels on metal framework in large commercial buildings. By following building plans that indicate the location of rooms and hallways, installers first saw metal rods and channels to size and bolt them together to make floor-to-ceiling frames. Then the installers attach the drywall panels to the frames with screws. These workers may also erect suspended ceilings by hanging metal bands from wires that are embedded in the unfinished concrete ceiling, running these band horizontally across the room, and crisscrossing them to form rectangular spaces for the ceiling panels.

The drywall finisher applies drywall tape and glue-like finishing compounds to the joints of adjacent panels and afterwards sands them down in order to achieve a smooth, unbroken surface on drywall ceilings and walls. The finisher must also deter-

mine how correctly to mix taping and finishing compounds to reach the proper workable consistency and must know how to use the variety of broadknives and finishing tools that are used by the profession. The drywall finisher most often works on surfaces before the painter applies the final decoration. In some cases the finisher may be required to apply a texture over the completed drywall surface. These textures may be hand rolled, stippled, troweled, or sprayed, depending upon the surface desired.

As with the other construction trades, drywall work is sometime strenuous. Installers and finishers spend most of the day indoors on their feet, either standing, bending, or squatting. They lift and maneuver heavy panels and may climb ladders and scaffolding. Statistics show that the accident rate for drywall workers is low compared with that for other building trades, though some workers develop allergic reactions to the dust that is created by sanding down the joint compound. As a precaution, workers sometimes wear protective masks.

### **Education, Training, and Hiring Requirements**

On-the-job training is the most likely route to a job in drywall installation and finishing. Helpers start by carrying materials, lifting and holding panels, and cleaning up debris. Within a few weeks, they learn to measure, cut, and install materials. Eventually, they become fully experienced workers.

Employers often prefer high school graduates who are in good physical condition, but they will frequently hire applicants with less formal education. High school or trade school courses in carpentry and basic arithmetic are excellent preparation for work in this field.

Some employers, in conjunction with local unions, provide special apprenticeship programs which supplement on-the-job training with a few hours of classroom instruction each week. This type of program generally lasts between one-and-a-half and two years.

After gaining experience as an installer or finisher, an ambitious worker with good leadership ability can become a supervisor within a few years. Some people strike out on their own and start a drywall contracting business.

## Industries That Employ Drywall Installers

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
174	Masonry, Stonework and Plastering	78.6
152	Residential Building Construction	13.8
154	Nonresidential Building Construction	7.3

Most drywall installers and finishers work for either contractors that specialize in drywall installation or contractors that perform many types of construction jobs.

## Occupational Earnings

Drywall workers are usually either salaried or paid hourly. Some contractors may even pay workers according to the number of panels installed or finished within a day.

## Employment Outlook

Like most construction trade jobs, drywall workers are participating in the Massachusetts development boom.

Employment of drywall installers is expected to have average growth through the year 2000 as the level of construction activity increases. Employment should grow faster in commercial construction than in residential construction.

Unlike some other construction trades, drywall installation is usually completed indoors, and workers seldom lose time due to bad weather. However they may be unemployed between construction projects and during downturns in construction activity.

## Related Occupations

Insulation Worker  
Floor Covering Installer  
Form Builder

Lather  
Plasterer



## Where to Write for More Information

Associated Builders and Contractors, Inc.  
729 15th Street, N.W.  
Washington, DC 20005

International Brotherhood of Painters &  
Allied Trades  
1750 New York Avenue, N.W.  
Washington, DC 20006

National Joint Painting, Decorating,  
and Drywall Apprenticeship and  
Training Committee  
1750 New York Avenue, N.W.  
Washington, DC 20006

United Brotherhood of Carpenters  
and Joiners of America  
101 Constitution Avenue, N.W.  
Washington, DC 20001

## Economist

Economists study the way society uses resources like land, labor, raw materials, and machinery to produce the goods and services we want and need. Economists often specialize in areas such as labor, agriculture, medicine, or international affairs. Private industry is the largest source of employment for economists, followed by government and education. In business, economist positions can be found in areas like insurance, banking, investment, manufacturing, and communications. Economists also work for trade associations, private consulting firms, and "think tanks."

Economists use both quantitative and qualitative research methods to advise government officials and corporate executives about the implications of economic change on business operations, policy and planning. For example, an economist working for an insurance company provides analytical support for the company's investment activities, devises forecasts, and conducts background research for new product lines. The primary function of an economist in a bank is to analyze how changes in the economy as a whole, and in various financial markets and business sectors in particular, affect earnings and to suggest new directions for the institution. In manufacturing, economists provide management with studies on product pricing and productivity and monitor the affect of interest rates and inflation on overhead, expenses and profits. In investment firms and brokerage houses, economists typically monitor industry trends, research companies, and devise forecasts in order to advise portfolio managers on which companies and markets to invest in. Job security in this field depends to a great degree on the accuracy of an economist's predictions.

Traditionally, economists employed by companies have been located in centralized research departments consisting of a range of job titles. With the recent trend toward cost cutting and efficiency, however, there is more pressure on



economists to demonstrate their ability to directly improve the "bottom line." They are now more likely to be spread out across the enterprise, where they can provide research and analysis for functions like planning, marketing, public relations, and finance.

In Massachusetts, jobs in economics tend to occur in and around the major cities, most notably Boston. Jobs can be found in business services; at the center of financial activity in banks, insurance companies, and investment firms; in high technology manufacturing firms off routes 128 and 495; and near major universities, where consulting firms like Data Resources and Abt Associates have "spun off" from leading local universities.

It takes years of experience and often an advanced degree to become a full-fledged economist. Entry-level opportunities do exist, however, for bachelor's degree graduates who can assist senior economists with their research.

Research assistants (sometimes called research or junior economists) do library research, compile and manipulate data, run econometric models, proofread reports, and prepare written summaries of the data and the literature they review. Depending upon the nature of the organization, assistants may conduct background research for speeches, generate material for industry newsletters and reports, and occasionally produce articles of their own for publication. Computer experience -- with both personal computers and mainframes -- is an important prerequisite for these positions. Research assistants are expected to be able to use and update data files, run statistical software packages, and develop charts and graphs in the course of assembling and representing data for senior staff.

### **Education, Training, and Hiring Requirements**

Entry-level research assistant positions are almost never advertised in the "help wanted" pages of the local newspaper. Hiring is generally done either by referral from a highly regarded economics department at a college or university or by direct application to a personnel department. There can be as many as two or three intermediate positions between research assistant and senior economist. Promotions are often based on educational attainment, accuracy, the quality of analyses, and initiative. At more responsible levels, the ability to manage one or more projects effectively at the same time and make presentations outside the organization are important requirements for success. Because senior economists job tenure is lengthy, it may be necessary for junior people to change employers in order to advance.

The educational background required for both research assistants and senior economists varies from sector to sector. Where entry-level opportunities exist, for example, in industry and government, a bachelor's degree from an institution with a

respected economics department and evidence of research ability are the customary prerequisites. Private industry has been less degree-oriented than either government or higher education; there, it is possible for a talented individual to progress to assistant and even senior economist without a Ph.D. Large government agencies like the Bureau of Labor Statistics and the Commerce Department hire employees at the bachelor's and master's levels (budgets permitting). Teaching opportunities at colleges and universities are highly competitive and, with the possible exception of extension services, almost always require a Ph.D.

Individuals contemplating a career in economics should have a thorough academic grounding in the field. Those interested in combining business and economics often take courses in banking and finance, business organization, and investments. Those preparing for graduate school usually take advanced economic theory, statistics, and econometrics. Labor economics, political economy, economic history, and public finance are useful background for careers in government. Writing and speaking ability, the ability to conceptualize and synthesize information, and motivation are important characteristics for successful economists. Because of the premium placed on professional referrals in hiring, economics students should consider working as teaching or research assistants while they are still in school. Intern and co-op positions in banks, investment firms, and government agencies can provide insights into the range of career opportunities open to economics majors.

### **Industries That Employ Economists**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
739	Miscellaneous Business Services	54.1
737	Computer and Data Processing Services	10.0
901	Federal Government	8.1
631	Life Insurance	6.5
902	State Government	5.2

### **Occupational Earnings**

Positions for research assistants can pay between \$17,000 and \$23,000 to start, depending upon the industry. It is not unusual for a respected senior economist to earn as much as \$65,000 or more per year.

### **Employment Outlook:**

Opportunities for economists are expected to grow at a moderate rate (23 percent) through 1995, given a favorable business climate. Insurance companies are

under particular pressure to streamline their operations since the deregulation of financial markets. Their ability to weather this transitional period will determine whether they maintain their position as the second largest employer of economists in Massachusetts. An overall decline in the number of college and university faculty positions may have a negative affect on opportunities in higher education for those with a doctorate in economics. Government hiring is expected to remain stable.

Employment in this occupational field is expected to grow faster than average as demand increases for financial, advertising, consulting, and research services reflecting the complexity of domestic and international economics and increased reliance on quantitative methods of analyzing business trends, forecasting sales, and planning of purchasing and production.

Those holding bachelor and master degrees with a strong background in quantitative techniques have good job prospects, although opportunities will be best for doctoral degree holders.

#### **Related Occupations**

Market Research Analyst  
Financial Analyst

Securities Sales Worker  
Budget Officer

#### **Institutions Providing Training in Massachusetts**

##### *Four-Year (Bachelor's) Degree:*

American International College  
1000 State Street  
Springfield, MA 01109  
(413) 737-7000

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2200

Amherst College  
Amherst, MA 01002  
(413) 542-2328

Regis College  
235 Wellesley Street  
Weston, MA 02193  
(617) 893-1820

Assumption College  
500 Salisbury Street  
Worcester, MA 01609  
(508) 752-5615

Salem State College  
352 Lafayette Street  
Salem, MA 01970  
(508) 745-0556



Babson College  
Babson Park  
Wellesley, MA 02157  
(617) 235-1200

Bentley College  
Beaver and Forest Streets  
Waltham, MA 02154  
(617) 891-2244

Boston College  
Lyons Hall 120  
Chestnut Hill, MA 02167  
(617) 552-3100

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2300

Brandeis University  
415 South Street  
Waltham, MA 02254  
(617) 647-2878

Clark University  
950 Main Street  
Worcester, MA 01610  
(508) 793-7431

College of the Holy Cross  
College Street  
Worcester, MA 01610  
(508) 793-2443

Emmanuel College  
400 The Fenway  
Boston, MA 02115  
(617) 277-9340

Fitchburg State College  
160 Pearl Street  
Fitchburg, MA 01420  
(508) 345-2151

Simmons College  
300 The Fenway  
Boston, MA 02115  
(617) 738-2107

Smith College  
Northampton, MA 01063  
(413) 584-0515

Southeastern Massachusetts  
University  
Old Westport Road  
North Dartmouth, MA 02747  
(508) 999-8605

Stonehill College  
North Easton, MA 02356  
(508) 238-1081

Suffolk University  
Beacon Hill  
Boston, MA 02108  
(617) 723-4700

Tufts University  
Medford, MA 02155  
(617) 381-3170

University of Lowell  
One University Avenue  
Lowell, MA 01854  
(508) 452-5000

University of Massachusetts--  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222

Wellesley College  
Wellesley, MA 02181  
(617) 235-0320



Framingham State College  
100 State Street  
Framingham, MA 01701  
(508) 620-1220

Gordon College  
255 Grapevine Road  
Wenham, MA 01984  
(508) 927-2300

Hampshire College  
Amherst, MA 01002  
(413) 549-4600

Harvard and Radcliffe Colleges  
Byerly Hall  
8 Garden Street  
Cambridge, MA 02138  
(617) 495-1551

Massachusetts Institute of Technology  
77 Massachusetts Avenue  
Cambridge, MA 02139  
(617) 253-4791

Merrimack College  
North Andover, MA 01845  
(508) 683-7111

Mount Holyoke College  
South Hadley, MA 01075  
(413) 538-2023

**Where to Write for More Information:**

American Economic Association  
1313 21st Avenue South  
Nashville, TN 37212

National Association of  
Business Economists  
28349 Chagrin Boulevard  
Suite 201  
Cleveland, OH 44122

Western New England College  
1215 Wilbraham Road  
Springfield, MA 01119  
(413) 782-3111

Westfield State College  
Western Avenue  
Westfield, MA 01085  
(413) 568-3311

Wheaton College  
Norton, MA 02766  
(508) 285-7722

Williams College  
P.O. Box 487  
Williamstown, MA  
(413) 597-2211

Worcester Polytechnic Institute  
Worcester, MA 01609  
(508) 793-5286

Worcester State College  
486 Chandler Street  
Worcester, MA 01602  
(508) 793-8040

American Marketing Association  
25 South Wacker Drive  
Chicago, IL 60606

## **Electrical Engineer**

At the entry level, the principal responsibility of electrical engineers is to analyze and redesign new electronic products that range from computer hardware, software, and support services to electronic toys. Product redesign often accounts for half or more of their time, and analysis of design and design support for the remainder. Entry level electrical engineers in manufacturing often perform tasks such as quality control, testing and field service installation, equipment repair, troubleshooting, and testing. In banking and insurance, tasks performed include simulation and statistical testing, computer hardware and software installation, testing and troubleshooting, and process modeling.

The typical work environment of electrical engineers varies enormously and depends on both the type of electrical engineering practiced and the industry in which it is practiced. Electrical engineers work in laboratories, in factories of all types, and in office and design environments.

Within a firm, an electrical engineer may work in one of a wide range of organizational areas -- product research and development, product design, systems engineering, production manufacturing, quality control and testing, simulation, computer software development, marketing, sales, customer service, or technical assistance. An electrical engineer must be extremely adaptable to all organizational areas within a company. This adaptability is particularly needed at the present time because electrical engineers are finding increasing opportunities in many nontraditional industries such as banking, insurance, and health care, in addition to manufacturing and services.

### **Education, Training, and Hiring Requirements**

To be hired at the entry level, an applicant must have a bachelor of science degree in electrical engineering. Most firms tend to recruit on a national basis because they try to obtain graduates from the top engineering schools; however, smaller firms look closely at graduates from colleges and universities in Massachusetts.

Since electrical engineers are very visible professional employees who frequently interact with other departments in a firm, excellent oral and written communication skills are vital to successful job performance. Employers also like to see a demonstration of an applicant's commitment to the engineering profession, such as membership in the Institute of Electrical and Electronic Engineers (IEEE). Any work experience in engineering that the applicant has acquired while attending school is a plus. An applicant who desires to work in a research and development setting must have excellent grades and a master's degree in electrical engineering.

There are no licensing or certification requirements for electrical engineers in most jobs in industry, the exception is power systems engineering, where the Professional Engineering license is strongly recommended due to the need for proper accountability in the construction of electrical power plant facilities. Membership in a professional organization is generally not required for initial hiring, except perhaps in jobs dealing with product reliability. In those cases, membership in the IEEE, or another professional engineering society, may be required.

An entry level electrical engineer is usually considered an engineer in training (EIT) for an undetermined amount of time, particularly if the engineer has already taken the first part of the professional engineer's licensing exam. After gaining some experience and completing the trial period, the young engineer becomes a full engineer. After additional work experience, the engineer may be ready to assume more responsibility, on both a project and a supervisory basis. At that time, the engineer may be promoted to senior electrical engineer and later to a team leader, project engineer, and finally to director of engineering.

To increase the chances of being promoted, an engineer should keep up with current trends in electronics by taking courses. After three to five years of experience, it is helpful to take a management course to become familiar with accounting and budgeting terminology. Most importantly, an engineer must always show initiative. Engineers who develop new processes and products or who otherwise excel are rewarded, because these technical achievements enable firms to maintain their competitive edge in the marketplace.

One employer of electrical engineers estimates that a master's degree increases an engineer's lifetime earnings by 10 to 15 percent. It is often found, however, that after five years of employment, an additional degree has no effect on an individual's salary level. At that point, most firms are interested solely in job performance and not in the additional education of electrical engineers.



## Industries That Employ Electrical Engineers

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
357	Computer and Office Equipment	20.3
366	Communication Equipment	15.0
367	Electronic Components and Accessories	12.5
892	Noncommercial Educational	8.4
382	Measuring and Controlling Devices	7.2
891	Engineering and Architectural Services	6.0
737	Computer and Data Processing Services	4.9
739	Miscellaneous Business Services	3.6
508	Machinery, Equipment and Services	2.9
901	Federal Government	2.2

## Occupational Earnings

Recently graduated electrical engineers with fewer than three years experience earned \$28,000 to \$33,000. Experienced engineers can earn \$50,000+ per year.

## Employment Outlook

Increased demand for computers, electronic consumer goods, communications equipment, and other electrical and electronic products is expected to result in much faster than average growth. Job opportunities for electrical and electronic engineers will be excellent. This type of engineering training offers a broad range of job possibilities. The need to remain competitive will require an increasing number of these engineers to update product designs, explore more cost efficient ways of producing goods, and develop new products.

## Related Occupations

Induction Coordination Power Engineer Electrical Design Engineer

## Institutions Providing Training in Massachusetts

### *Four-Year (Bachelor's) Degree:*

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2000

Suffolk University  
Beacon Hill  
Boston, MA 02108  
(617) 723-4700



Central New England College of  
Technology  
768 Main Street  
Worcester, MA 01608  
(508) 755-4313

Harvard and Radcliffe Colleges  
Byerly Hall  
8 Garden Street  
Cambridge, MA 02138  
(617) 495-1551

Massachusetts Institute of Technology  
77 Massachusetts Avenue  
Cambridge, MA 02139  
(617) 253-4791

Merrimack College  
North Andover, MA 01845  
(508) 683-7111

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2300

Southeastern Massachusetts University  
Old Westport Road  
North Dartmouth, MA 02747  
(508) 999-8605

#### **Where to Write for More Information**

Institute of Electrical &  
Electronics Engineers/  
United States Activities Board  
1111 19th Street, N.W., Suite 608  
Washington, D.C. 20036

Tufts University  
Medford, MA 02155  
(617) 381-3170

University of Lowell  
One University Avenue  
Lowell, MA 01854  
(508) 452-5000

University of Massachusetts--  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222

Wentworth Institute of Technology  
550 Huntington Avenue  
Boston, MA 02115  
(617) 442-9010

Western New England College  
1215 Wilbraham Road  
Springfield, MA 01119  
(413) 782-3111

Worcester Polytechnic Institute  
Worcester, MA 01609  
(508) 793-5000

Jets  
1420 King Street  
Alexandria, VA 22314

## **Electrical or Electronic Technician**

Over 90 percent of these technicians work either: (a) in benchwork jobs such as testing or troubleshooting of hardware systems using a variety of automated or automatic test equipment; or (b) as engineering assistants for engineering design or engineering circuits design. Electrical and electronic technicians typically write engineering change orders for circuits and applications designs and provide drafting support with computer-aided design equipment.

Most electrical and electronic technicians work either on the manufacturing floor in the production process or in isolated design areas. They work in a wide variety of organizational areas within a firm. Using computer equipment, oscilloscopes, voltmeters, and computer-driven test equipment, these technicians make prototype and predesigned products and parts practicable and make frequent modifications to existing designs.

According to one employer's placement office, there are two major misconceptions about the work of electrical and electronic technicians. First, students are surprised that the work is often so routine. The nature of the work requiring the services of electrical and electronic technicians in a manufacturing support function such as quality control and testing is traditionally very repetitive. The second misconception concerns the importance of communication skills, which are far more important in a manufacturing setting than is generally believed. An electrical and electronic technician must be able to speak and write clearly.

### **Education, Training, and Hiring Requirements**

Electrical and electronic technicians are usually recruited through either direct application or help-wanted advertising. Senior level technicians are often recruited through job fairs held periodically throughout the state. Most new entrants come from the greater Boston area, within Route 495. Some, however, come from the Hartford, Connecticut area and Rhode Island; a few are from Maine and southern New Hampshire.

Most entry-level electrical and electronic technicians have completed one to two years in a postsecondary program that offers testing, but there are frequent variations in those standards among firms. Firms seeking experienced technicians usually require two or three years' experience in electronics or another closely related field.

Desirable traits for electrical and electronic technicians are ambition, independence, and enthusiasm, which are indicated by obtaining related part-time work while in school. Strong communication skills are also necessary. Employers

prefer applicants to have experience in the use of microwave equipment while in school; but this equipment is so expensive, that few schools can afford it.

On a resume, the preferred items are coursework in a specific electrical and electronic technician program, related work experience, and a history of interest in electronics as a "hands on" hobby at home. During an interview, employers look for self-confidence, enthusiasm, and communication skills.

To move from entry level to senior level and to supervisory positions, a bachelor's degree in engineering technology or engineering is helpful. Other factors that aid in upward mobility for electrical and electronic technicians include: keeping skills current, keeping track of where technology is heading, and knowing which areas of specialization in electronics are growing.

### **Industries That Employ Electrical and Electronic Technicians**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
357	Computer and Office Equipment	16.5
367	Electronic Components and Accessories	16.3
382	Measuring and Controlling Devices	8.2
736	Personnel Supply Services	7.7
508	Machinery, Equipment, and Supplies	7.5
366	Communication Equipment	6.9
506	Electrical Goods	4.5
481	Telephone Communications	2.9
892	Noncommercial Educational Services	2.5
739	Miscellaneous Business Services	2.2

### **Occupational Earnings**

As students, electrical and electronic technicians in Massachusetts earn from \$6.50 to \$10.00 an hour. The average is \$8.00. Overtime is often necessary, depending on the time of year and contract requirements.

### **Employment Outlook**

Job growth in this field is expected to be faster than average, outpacing the job growth for electrical and electronic engineers. Strong demand for computers, communication equipment, and other electrical products will promote job growth. However, continuous improvements in solid-state technology have reduced service requirements and will keep employment levels from rising as fast as otherwise would be expected.



## **Related Occupations**

Wirer  
Assembler

Printed Circuit Board  
Assembler

## **Institutions Providing Training in Massachusetts**

### *Two-Year, (Associate's) Degree:*

Bunker Hill Community College  
New Rutherford Avenue  
Charlestown, MA 02129  
(617) 241-8600

Springfield Technical Community  
College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

Franklin Institute of Boston  
41 Berkeley Street  
Boston, MA 02116  
(617) 423-4630

### *Vocational Education Programs:*

See Appendix C

## **Where to Write for More Information:**

Jets Inc.  
345 East 47th Street  
New York, NY 10017

Communications Workers of  
America  
1925 K Street, N.W.  
Washington, D.C. 20006

International Society of  
Certified Electronics  
Technicians  
2708 W. Berry, Suite 3  
Fort Worth, TX 76109

International Brotherhood of  
Electrical Workers  
1125 15th Street, N.W.  
Washington, D.C. 20005

Electronics Technicians'  
Association  
604 N. Jackson Street  
Greencastle, IN 46135

National Association of Television  
and Electronic Servicers of  
America (NATESA)  
4621 N. Kedzie Avenue  
Chicago, IL 60629



## **Electrician**

The electrical industry is large and encompasses many different fields. Heating, lighting, power, air conditioning, and refrigeration components all operate through electrical systems that are assembled, installed, and maintained by electricians. Electricians usually specialize in either construction or maintenance.

Construction electricians wire buildings. They are responsible for the installation of all wires, busses, conduits, switches, converters, transformers, electric motors, and other stationary electrical apparatus in residential, commercial, and industrial buildings.

Maintenance work varies greatly and depends on where the electrician is employed. Those who are employed in large factories may repair particular items such as motors or electric controllers for machine tools and equipment. Electricians that work in office buildings and in small plants repair all kinds of electrical equipment.

Electricians may also be employed as installers and repairers of telecommunications equipment and computer cables. The telephone company (and sometimes other utilities) hires electricians to install and maintain phone lines.

Electricians use hand tools such as screwdrivers, pliers, knives, and hacksaws. They also use power tools, testing equipment, and oscilloscopes.

Electricians must be able to troubleshoot, that is, when problems occur, they must be able to locate the cause, determine the solution, and make repairs.

Electricians, like most skilled tradespersons, perform active and sometimes strenuous work. They may work on scaffolding and on ladders. Depending on the job, they may find themselves working in confined and cramped positions.

### **Education, Training, and Hiring Requirements**

Most experts suggest the completion of a union-sponsored apprenticeship program as preparation for entering the field of electrical work. Apprenticeship provides planned, on-going, on-the-job experience. Under the supervision of a master electrician, the apprentice will learn the technical aspects of the trade, as well as related skills.

## **Industries That Employ Electricians**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
173	Electrical Work	63.8
902	State Government	4.2
822	Colleges and Universities	2.5
903	Local Government	2.5
806	Hospitals	2.3
386	Photographic Equipment and Supplies	1.5
357	Computer and Office Equipment	1.2
401	Railroads	1.2
152	Residential Building Construction	1.1

## **Occupational Earnings**

Earnings for electricians in metropolitan Boston range from \$400 to \$700 per week depending on experience.

## **Employment Outlook**

Average job growth is expected for electricians resulting from the need to install and maintain electrical wiring in new facilities and replace existing wiring. In addition, buildings will increasingly be prewired during construction to accommodate use of computers and telecommunication equipment. Installation of this equipment, which is expected to increase sharply, should stimulate many job opportunities for electricians.

Job opportunities for electricians vary by geographic area following the movement of people and businesses among areas and reflect differences in local economic conditions.

## **Related Occupations**

Installer, Electrical Equipment - Street Light Service

Signal Repairer

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Berkshire Community College  
West Street  
Pittsfield, MA 01201  
(413) 499-4660

Bristol Community College  
777 Elsbree Street  
Fall River, MA 02720  
(508) 678-2811

Franklin Institute of Boston  
41 Berkeley Street  
Boston, MA 02116  
(617) 423-4635

Springfield Technical Community College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

Wentworth Institute of Technology  
550 Huntington Avenue  
Boston, MA 02115  
(617) 442-9010

### *Vocational Education Programs:*

See Appendix C

## **Where to Write for More Information**

Independent Electrical Contractors, Inc.  
1101 Connecticut Avenue, N.W., Suite 700  
Washington, D.C. 20036

International Brotherhood of Electrical Workers  
1125 15th Street, N.W.  
Washington, D.C. 20005

National Electrical Contractors' Association  
7315 Wisconsin Avenue  
Bethesda, MD 20814

National Joint Apprenticeship and Training Committee for the Electrical Industry  
9700 E. George Palmer Highway  
Lanham, MD 20706

Associated Builders and Contractors  
729 15th Street, N.W.  
Washington, D.C. 20005

## **Electromechanical Assembler**

An electromechanical assembler assembles, tests, and repairs precision equipment such as servomechanisms, gear trains, gyros, dynamometers, wave guides, magnetic drums, and tape drives. Following blueprints, diagrams, and oral and written instructions, an assembler measures cams, shafts, gears, and bearings with precision measuring instruments to verify conformance to specified tolerances. An assembler also examines parts for defects and measures the diameter of holes. Finally, an assembler fits parts together; installs them in housings, while aligning the parts to ensure the smooth operation of mechanical parts; and tests the assembled equipment with function test instruments to locate defects.

Electromechanical assembly work requires a high degree of accuracy. Workers must be able to interpret detailed specifications and instructions and apply independent judgment. Some experienced assemblers work with engineers and technicians assembling prototypes or test products.

For the most part, electromechanical assemblers sit at tables or work in rooms that are clean, well lighted, and free of dust. When assembling certain types of mechanisms, however, they come in contact with oil and grease and their work area may be quite noisy. In addition, assemblers may have to lift and fit heavy objects.

### **Education, Training, and Hiring Requirements**

Electromechanical assemblers often come from the ranks of workers in less skilled jobs. The ability to do accurate work at a fast pace is a key job requirement. For many jobs, however, employers require technical school diplomas or equivalent military training.

Good eyesight, with or without glasses, may be required for assemblers who work with small parts. For electromechanical products containing many different colored wires, assemblers usually are given a test for color blindness.

### **Industries That Employ Electromechanical Assemblers**

Virtually all electromechanical assemblers are found in the manufacture of durable goods.



<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
367	Electronic Components and Accessories	28.3
357	Computer and Office Equipment	24.4
382	Measuring and Controlling Devices	15.8
381	Search and Navigation Equipment	8.1
366	Communication Equipment	5.0
361	Electric Distribution Equipment	4.6
354	Metalworking Machinery	2.8
355	Special Industry Machinery	2.5
356	General Industrial Machinery	2.2

### **Occupational Earnings**

An experienced electromechanical assembler earns between \$7.50 and \$10.10 per hour, although some earn substantially more. A typical wage for those with less experience ranges between \$6.00 and \$8.29 per hour, according to the Department of Employment and Training publication, "Selected Occupational Wages in Manufacturing Industries."

### **Employment Outlook**

Employment of electromechanical assemblers is expected to remain unchanged through the year 2000 as increased use of automation and "outsourcing" -- the practice of moving assembly operations to countries where labor is cheaper -- take their toll on assembly jobs in manufacturing. Virtually all job openings will result from the need to replace workers who transfer to other occupations or leave the labor force.

Recent advances in robotics and in vision and touch sensing systems have made automation of many routine assembly jobs possible. Many electromechanical jobs, however, are in difficult-to-reach locations (such as gear boxes) or are job-specific (such as the building of prototypes or product development). Therefore, the replacement of electromechanical assemblers by automated processes will be slower and less complete than for routine assembly occupations such as welding.

### **Related Occupations**

Operator of Drill Presses, Laminating  
Machines, or Riveting  
Machines

Ophthalmic Laboratory  
Technician  
Welder

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Berkshire Community College  
West Street  
Pittsfield, MA 01201  
(413) 499-4660

Bristol Community College  
777 Elsbree Street  
Fall River, MA 02720  
(508) 678-2811

Franklin Institute of Boston  
41 Berkeley Street  
Boston, MA 02116  
(617) 423-4635

Holyoke Community College  
303 Homestead Avenue  
Holyoke, MA 01040  
(413) 538-7000

Massasoit Community College  
The Technical Institute at Blue Hills  
100 Randolph Street  
Canton, MA 02021  
(617) 828-5800

Massasoit Community College  
One Massasoit Boulevard  
Brockton, MA 02402  
(508) 588-9100

Middlesex Community College  
Springs Road  
Bedford, MA 01730  
(617) 275-8910

North Shore Community College  
3 Essex Street  
Beverly, MA 01915  
(508) 927-4850

Springfield Technical Community  
College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

### *Vocational Education Programs:*

See Appendix C

## Electronic Test Technician

These technicians test and troubleshoot electronic circuits to the component level. Two major methods are used. In fire and print testing, an electronic circuit is tested for "opens" and "shorts," which destroy circuit continuity. In chip and wire testing, a printed circuit board is populated with electronic components and then each component is functionally tested. Electronic test technicians also provide testing procedures and documentation to electronic testers, analyze electrical circuits for failure, and support nontechnical workers in both testing and other areas of quality control.

The occupation of electronic test technicians is changing all the time and, in order to keep up, they should continue to update their skills in school. A thorough knowledge of electronic theory is essential.

The work environment of electronic test technicians is usually a quiet, well-lit test and repair department. While seated at a bench or standing next to equipment and machines, technicians spend much time testing and troubleshooting circuits and components. Technicians use two sets of equipment, one for continuity testing and one for functional testing. In continuity testing, computer-controlled equipment with interfaces and peripherals to record data are used to conduct capacitance and resistance continuity testing. In functional testing, oscilloscopes, digital and analog meters, sine or pulsed signal generators, spectrum analyzers, and impedance bridges are used to inject electrical signals into printed circuits in order to record a circuit reaction. These devices measure circuit voltages, currents, and resistance by recording the nature of the output signals.

Before choosing to be an electronic test technician, a new applicant should decide which field of electronics he or she would like to pursue. An applicant should also know that the position requires a good deal of technical support to both new technical people on the factory floor and to customers. Consequently, strong interpersonal skills are needed. A technician must possess lots of patience with non-technically oriented people and must communicate clearly and understandably with people of widely varying backgrounds.

In some firms, electronic test technicians assume a much broader scope of activity than is often perceived. In the role of troubleshooter, an electronic test technician with experience often works closely with engineers in design, support, and manufacturing. The job is a complex and challenging one.



## **Education, Training, and Hiring Requirements**

Electronic test technicians are usually recruited from two-year colleges, public vocational educational institutions, and private proprietary post-secondary schools. In this field, a firm theoretical basis in electronics is critical to the complete understanding of electronic systems. Recruiting technicians directly from school ensures that they are trained in the latest techniques. Most technicians are recruited from schools either in adjacent cities or in other parts of Massachusetts.

To be hired at the entry level, a new electronic test technician must have a certificate in electronics technology. Many firms, however, require a minimum of an associate's degree. Some desirable characteristics of electronic test technicians include: proficiency with computers, because so much electronic equipment is computer-driven or numerically controlled; good vision and good hand-eye coordination, to be able to work microscopes and other equipment; strong interpersonal skills, to work well in a team environment; ability to work well with one's hands; an interest in solving problems; and the flexibility to work in a changing environment.

In some firms, technicians may be required to obtain Federal Communications Commission (F.C.C.) licenses if they expect to work on critical or sensitive equipment that may be dangerous to the general public.

Some employers feel that the basic electronics courses offered in electronic test technician programs are too narrow in scope. The theoretical basis of electronics needs further emphasis; courses in physics, chemistry, computers, and electronics should be offered on a basic theoretical level.

Writing skills are very important for electronic test technicians. They must be able to communicate the results and findings of their work clearly and concisely. They should be able to write directions on assembly, troubleshooting, and repair of equipment and parts so that both other technicians and lay people can understand them. Finally, technicians should stay up-to-date by belonging to electronics book clubs and by reading shop manuals and trade publications.

To progress along a career path, an electronics test technician needs additional formal schooling. A strong theoretical understanding of electronics is vital. To progress from electronic test technician to senior electronic technician to supervisor of electronic technicians to electrical engineer, an employee must demonstrate a strong interest in the job and in the field of electronics and must obtain a bachelor's degree in engineering. Without a bachelor's degree, an electronic test technician will find it difficult to become a full-fledged electrical engineer, even if the technician can or does perform the duties of an engineer.



## Industries That Employ Electronic Test Technicians

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
357	Electronic Components	5.8
366	Communications Equipment	4.9
372	Aircraft and Parts	4.4
357	Office and Computing Machinery	2.9

## Occupational Earnings

The starting pay for electronic test technicians is \$7.00 to \$8.00 an hour.

## Employment Outlook

Employment of electronic test technicians is expected to increase at a greater than average rate in response to growth in the electronics industry. Strong demand for computers, communication equipment, and other electrical products will enhance job growth in this occupation. Improvements in solid state technologies have reduced service requirements and have kept employment at a lower level than one might expect.

## Institutions Providing Training in Massachusetts

Northeast Institute of Industrial  
Technology  
41 Phillips Street  
Boston, MA 02114  
(617) 523-2813

RETS Electronics School  
965 Commonwealth Avenue  
Boston, MA 02215  
(617) 783-1197

## *Vocational Education Programs:*

See Appendix C

## Elementary School Teacher

Elementary school teachers provide children in kindergarten through sixth grade with an introduction to English, mathematics, science, and social studies. Most teachers spend the school year working with children in one class, usually in one grade level, and following a general curriculum. Teachers outline the materials, approaches, and timetables for implementing the curriculum in detailed lesson plans which they follow each day, week, and month.

Teachers use tangible teaching tools like textbooks, films, and guest speakers. They often draw upon the physical environment -- the weather, found objects, plants, and animals -- to present concepts to children in interesting ways. Important intangibles are the teacher's ability to inspire, to communicate effectively, and to gear the subject to the children's individual developmental levels. Frequently, teachers devise their own instructional aids, like flash cards, charts, and games, to reinforce what they are teaching. They often use tests and homework to measure what their pupils are learning.

Some teachers specialize in specific areas, like music, art, and physical education, teaching these subjects to several classes and grade levels each day. Others focus on bilingual education or on children with special needs, working individually with the children and their classroom teachers to meet educational goals.

Because teachers spend so many waking hours with children, they have become the medium through which children learn important social values, like cooperation and honesty. They provide their students with many of the intellectual, social, and emotional tools they will need to lead full and productive lives.

Classroom teachers may work alone or in teams. Depending on the school, there may be instructional aides, student interns, or parent volunteers in the classroom to make individual attention and small group instruction possible. Physical conditions, class size and equipment budgets vary widely from school to school. Teacher involvement in curriculum design and policy development varies as well. Most grading and class preparation are done in the evening outside of school, making the workday as long for teachers as it is in many other professions. Teachers frequently bring their own books and materials to school and spend money out-of-pocket for projects and demonstrations.

Teachers report to an instructional director or, in many cases, directly to a principal. The school year generally spans ten months, allowing teachers two months in which to earn extra money, pursue other interests, or obtain additional in-service training.

Teaching opportunities exist in public and private schools. Generally speaking, public schools tend to offer better salaries and benefits, while private schools sometimes provide better surroundings, smaller classes, and special equipment. Some private schools are organized around a particular educational philosophy, like the Montessori schools. Others are operated by churches or religious groups.

### **Education, Training, and Hiring Requirements**

In order to teach in the public schools, candidates are required to have either a B.A. or B.S. and certification to teach in Massachusetts from an accredited institution. For new hires, successful student teaching experience is an important qualification.

Those considering elementary education should enjoy being with children and should be sincerely interested in helping them learn and grow. They should understand that the occupation is both physically and emotionally demanding but can offer a great deal of personal satisfaction.

### **Industries That Employ Elementary School Teachers**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
802	Education Public and Private	100.0

### **Occupational Earnings**

In more than half the districts in the Commonwealth, the starting salary for teachers with a bachelor's degree is \$18,000. Many systems offer additional compensation for extra-curricular assignments, like coaching, as well as tuition reimbursement for additional coursework.

### **Employment Outlook**

Teaching is one of the largest occupations in Massachusetts. According to state figures, 38,140 elementary and pre-school teachers worked in the Commonwealth in 1984.

As mentioned before, there have been recent legislative efforts to improve salaries and provide opportunities for career mobility. A 1987 report on the status of teacher supply and demand commissioned by the Massachusetts Department of Education provides some useful observations about the number and location of jobs in the profession, now and into the next decade. According to the Massachusetts Institute for Social and Economic Research (MISER), which prepared the report, "primary grade enrollments, kindergarten--6, have already reached their minimum at 414,281 in 1985" and are now on the increase in many, although not all, cities and towns in the Commonwealth. The researchers contend that future enrollments will vary greatly among communities, creating "shortages ... in some places at times when others have sufficient supply."

The MISER report suggests that those considering careers in elementary education need to look beyond their local communities when evaluating their career prospects. According to the report, the decision to teach elementary school is often based on information about how many teachers were hired in the recent past. A better measure of demand, the report suggests, is how many teachers will be needed in the future. Some of the factors influencing demand in the communities are the number of



families, the size and composition of the school-age population, and the age of the existing teacher workforce. Demand at the elementary level is expected to rise moderately through 1995 and to be greatest where there are more families with young children and a higher incidence of teacher retirements.

Massachusetts' educational policymakers are concerned with the disparity between the number of minority and bilingual children in the schools and the number of minority and bilingual teachers available to them. According to the MISER report, out of 2,653 graduates of teacher training programs in 1986, only 172 were members of minority groups. Of the 228 new teachers hired by the public schools in that year, only 8 were minority. Given the increasing number of minority and bilingual children entering the schools, the report suggests that the Department of Education devise incentives to attract more minority and bilingual graduates into teaching.

Some of the communities with significant minority and bilingual enrollments include Boston, Newton, Brookline, Lynn, Salem, Waltham, and Lexington in eastern Massachusetts; Lowell and Lawrence in the northeast; and Brockton, New Bedford, and Wareham in the southeast. In central Massachusetts, Worcester, Fitchburg, and Leominster have minority enrollments larger than 10 percent, as do Holyoke, Springfield and Amherst in the western part of the state.

Average employment growth is expected for preschool teachers as enrollments increase and class sizes decline. Rising enrollments reflect the increase in births beginning in the mid-1970s. The drop in class sizes is a result of the recent emphasis on improving student-teacher ratios.

Job opportunities are expected to be good through the mid 1990s for well-qualified candidates, with the possibility of a slight decline in the need for elementary teachers as enrollments level off and then drop, reflecting a similar pattern in births some years earlier.

## **Related Occupations**

Guidance Counselor

Middle School Teacher

## **Institutions Providing Training in Massachusetts**

### *Four-Year (Bachelor's) Degree:*

American International College  
1000 State Street  
Springfield, MA 01109  
(413) 737-7000

Eastern Nazarene College  
23 East Elm Avenue  
Wollaston, MA 02170  
(617) 773-2373



Anna Maria College for Men and  
Women  
Sunset Lane  
Paxton, MA 01612  
(508) 757-4586

Assumption College  
500 Salisbury Street  
Worcester, MA 01609  
(508) 752-5615

Atlantic Union College  
South Lancaster, MA 01561  
(508) 365-4561

Berkshire Christian College  
Lenox, MA 01240  
(413) 637-0838

Boston College  
Lyons Hall 120  
Chestnut Hill, MA 02167  
(617) 552-3100

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2000

Brandeis University  
415 South Street  
Waltham, MA 02254  
(617) 647-2878

Bridgewater State College  
Tillinghast Hall  
Bridgewater, MA 02324  
(508) 697-1237

Clark University  
950 Main Street  
Worcester, MA 01610  
(508) 793-7431

Emmanuel College  
400 The Fenway  
Boston, MA 02115  
(617) 277-9340

Hampshire College  
Amherst, MA 01002  
(413) 549-4600

North Adams State College  
Church Street  
North Adams, MA 01247  
(413) 664-4511

Pine Manor College  
400 Heath Street  
Chestnut Hill, MA 02167  
(617) 731-7000

Simmons College  
300 The Fenway  
Boston, MA 02115  
(617) 738-2000

Stonehill College  
Washington Street  
North Easton, MA 02356  
(508) 238-1081

Suffolk University  
Beacon Hill  
Boston, MA 02108  
(617) 723-4700

University of Massachusetts--  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222

Worcester State College  
486 Chandler Street  
Worcester, MA 01602  
(508) 793-8000

Curry College  
Milton, MA 02186  
(617) 333-0500

### **Where to Write for More Information**

American Federation of Teachers  
555 New Jersey Avenue, N.W.  
Washington, DC 20001

Massachusetts Department of  
Education  
1385 Hancock Street  
Quincy, MA 02169

National Council for Accreditation  
of Teacher Education  
1919 Pennsylvania Avenue, N.W.  
Suite 202  
Washington, DC 20006

### **Employment Interviewer**

Employment interviewers work as employment "brokers" matching job seekers with employers looking for qualified staff. People employed in this field are sometimes referred to as account representatives, manpower development specialists, counselors, or personnel consultants.

Employment interviewers usually work for private personnel consultant firms or at Opportunity Job Centers, of the Massachusetts Department of Employment and Training. Employers generally pay private agencies for finding workers, while the services provided by state agencies are supported by the government are therefore available at no cost to both employers and prospective employees.

A major function of the interviewer's job is to develop and maintain a good relationship with employers. By gaining an understanding of the type of business an employer conducts, by learning which skills and training are required of employees, and by helping the employer determine present and future hiring needs, the interviewer demonstrates a strong commitment to helping the company find qualified candidates for positions.

Another important aspect of the job is locating and recruiting qualified individuals. Some interviewers, especially in the private sector, rely on the information provided through resumes; others administer tests; and still others meet with applicants to determine skill levels, educational background, and experience. Employment interviewers also need to elicit specific information from job seekers about their interests, aptitudes, the types of jobs that they are interested in, the salaries they need

or expect, and any other requirements -- like special equipment to assist someone with a physical handicap.

Employment interviewers at Opportunity Job Centers may instruct job hunters in interviewing skills and resume writing. People with limited job skills and no clear idea of what kind of work they can do pose a challenge for Job Center personnel. Interviewers often join forces with career or vocational counselors to assist these people in identifying appropriate occupations and training and then refer them to job training programs or suitable positions.

Many private placement firms specialize in placing applicants in particular fields, such as secretarial, word processing, engineering, accounting, law, and health occupations. These employment interviewers, or counselors, usually don't need to provide more direct assistance to the client than background information on the company with which an interview is scheduled, along with some advice about interviewing techniques.

Temporary help services have become a booming industry. They meet businesses' growing demand for workers to fill in for permanent staff and to help out during peak periods. Employment interviewers in these temporary help agencies take job orders from client companies and match their requests against a list of available workers. A worker is then notified that work is available and is referred to a firm requiring assistance. Even though an employee is working for a client company, he or she is employed by the temporary agency. It is the employment interviewer's responsibility to make regular checks to ensure that the temporary employee has been properly placed.

### **Education, Training, and Hiring Requirements**

Good interpersonal skills and the ability to deal successfully with both employers and job seekers are the most important characteristics for success in the field of employment interviewing. Most private agencies prefer to hire college graduates for their employment interviewer positions; however, a degree is not always a prerequisite. Hiring requirements tend to reflect a firm's management approach, along with the type of placements in which it specializes. For example, agencies that concentrate on placing professionals in accounting, law, and engineering often want their staffs to have some training or experience in those fields.

In the public sector, the possession of a college degree is not always a requirement. Sometimes related work experience and training can be substituted for a bachelor's degree. College graduates, however, are likely to be at an advantage in competing for jobs.



Advancement in the public sector is based on a merit system, with promotions to supervisory positions being very competitive. In personnel consulting firms, job growth usually takes the form of greater responsibility and higher pay. Successful employment interviewers may also leave and open their own firms.

### **Industries That Employ Employment Interviewers**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
736	Personnel Supply Services	59.5
902	State Government	33.5

### **Occupational Earnings**

In private agencies, employment interviewers are generally paid on commission. Their annual earnings range from the high teens to the mid-twenties.

Interviewers in the public sector are usually paid by salary, which varies from state to state. Starting salaries range from \$9,800 to \$20,200.

### **Employment Outlook**

Increased growth is expected in this field. Most of the new jobs will be in the areas of temporary help services and personnel consulting. Little growth is expected within the public sector; however, there usually is substantial personnel turnover, resulting in the hiring of replacements.

### **Related Occupations**

Personnel Officer

College Career Counselor

Vocational Rehabilitation

Counselor

### **Institutions Providing Training in Massachusetts**

#### *Two-Year (Associate's) Degree:*

Becker Junior College--Worcester  
61 Sever Street  
Worcester, MA 01609  
(508) 791-9241

Lasell Junior College  
1844 Commonwealth Avenue  
Newton, MA 02116  
(617) 243-2225



Berkshire Community College  
West Street  
Pittsfield, MA 01201  
(413) 499-4660

Bunker Hill Community College  
New Rutherford Avenue  
Charlestown, MA 02129  
(617) 241-8600

Endicott College  
376 Hale Street  
Beverly, MA 01915  
(508) 927-0585

Holyoke Community College  
303 Homestead Avenue  
Holyoke, MA 01040  
(413) 538-7000

*Four-Year (Bachelor's) Degree:*

American International College  
1000 State Street  
Springfield, MA 01109  
(413) 737-7000

Amherst College  
Amherst, MA 01002  
(413) 542-2328

Anna Maria College  
Sunset Lane  
Paxton, MA 01612  
(508) 757-4586

Assumption College  
500 Salisbury Street  
Worcester, MA 01609  
(508) 752-5615

Boston College  
Lyons Hall 120  
Chestnut Hill, MA 02167  
(617) 552-3100

Massasoit Community College  
One Massasoit Boulevard  
Brockton, MA 02402  
(508) 588-9100

Mount Ida College  
777 Dedham Street  
Newton Centre, MA 02159  
(617) 969-7000

Mount Wachusett Community  
College  
444 Green Street  
Gardner, MA 01440  
(508) 632-6600

Mount Holyoke College  
South Hadley, MA 01075  
(413) 538-2023

North Adams State College  
Church Street  
North Adams, MA 01247  
(413) 664-4511

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2200

Regis College  
235 Wellesley Street  
Weston, MA 02193  
(617) 893-1820

Salem State College  
352 Lafayette Street  
Salem, MA 01970  
(508) 745-0556

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2300

Bradford College  
320 South Main Street  
Bradford, MA 01830  
(508) 372-7161

Brandeis University  
415 South Street  
Waltham, MA 02254  
(617) 647-2878

Bridgewater State College  
Tillinghast Hall  
Bridgewater, MA 02324  
(508) 697-1237

Clark University  
950 Main Street  
Worcester, MA 01610  
(508) 793-7431

College of the Holy Cross  
College Street  
Worcester, MA 01610  
(508) 793-2443

Curry College  
Milton, MA 02186  
(617) 333-0500

Eastern Nazarene College  
23 East Elm Avenue  
Wollaston, MA 02170  
(617) 773-2373

Simmons College  
300 The Fenway  
Boston, MA 02115  
(617) 738-2107

Simon's Rock of Bard College  
Alford Road  
Great Barrington, MA 01230  
(413) 528-0771

Southeastern Massachusetts  
University  
Old Westport Road  
North Dartmouth, MA 02747  
(508) 999-8605

Springfield College  
263 Alden Street  
Springfield, MA 01109  
(413) 788-3136

Stonehill College  
Washington Street  
North Easton, MA 02356  
(508) 238-1081

Suffolk University  
Beacon Hill  
Boston, MA 02108  
(617) 723-4700

Tufts University  
Medford, MA 02155  
(617) 381-3170

University of Lowell  
Duggan Hall  
One University Avenue  
Lowell, MA 01854  
(508) 452-5000

Elms College  
291 Springfield Street  
Chicopee, MA 01013  
(413) 598-8351

Emmanuel College  
400 The Fenway  
Boston, MA 02115  
(617) 277-9340

Fitchburg State College  
160 Pearl Street  
Fitchburg, MA 01420  
(508) 345-2151

Framingham State College  
100 State Street  
Framingham, MA 01701  
(508) 620-1220

Gordon College  
255 Grapevine Road  
Wenham, MA 01984  
(508) 927-2300

Hampshire College  
Amherst, MA 01002  
(413) 549-4600

Harvard and Radcliffe Colleges  
Byerly Hall  
8 Garden Street  
Cambridge, MA 02138  
(617) 495-1551

Merrimack College  
North Andover, MA 01845  
(508) 683-7111

University of Massachusetts--  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222

University of Massachusetts -  
Boston  
Harbor Campus  
Boston, MA 02125  
(617) 929-7102

Wellesley College  
Wellesley, MA 02181  
(617) 235-0320

Western New England College  
1215 Wilbraham Road  
Springfield, MA 01119  
(413) 782-3111

Westfield State College  
Western Avenue  
Westfield, MA 01085  
(413) 568-3311

Wheaton College  
Norton, MA 02766  
(508) 285-7722

Williams College  
P.O. Box 487  
Williamstown, MA  
(413) 597-2211

Worcester Polytechnic Institute  
486 Chandler Street  
Worcester, MA 01609  
(508) 793-5286



## **Financial Analyst**

Financial analysts, also called investment or research analysts, study investments and economic trends for banks, insurance companies, brokerage and investment management firms, and private companies. Depending upon the setting, they may investigate potential companies for acquisition by a larger firm; determine the value of certain stocks and bonds for potential investors; study new products and market trends; and, generally speaking, conduct financial research for corporate, governmental, and individual decision makers. Among the tools which the financial analyst uses are daily stock and bond reports, financial periodicals, securities manuals, and with time, experience and intuition. The job often involves personal interviews at businesses being considered for investment. These interviews can mean a great deal of travel -- to glamorous cities and not-so-glamorous company towns. Analysts assemble all of the information they gather into lengthy reports on the value of the potential investments.

For example, an investment management firm or brokerage house may request its analysts to research new companies which are considered to have growth potential but whose stock is still priced low enough to yield big dividends for investors. The analyst's job is to study selected newcomers and advise portfolio managers and stockbrokers either to purchase stock or to encourage their clients to do so. Obviously, job security in the occupation depends in large measure on an analyst's ability to pick winners over losers.

In large firms, much of the hiring for entry-level analysts is done through campus recruiting at colleges and universities. Smaller firms that do not have the capacity to train often require one to two years' experience in the field. Research analysts can progress to senior analysts and portfolio managers.

In recent years, the career of a financial analyst has acquired a glamorous reputation. In reality, managers tell us that it is a high-pressure, competitive field that demands a great deal of hard work and long hours. Promotions are difficult to obtain -- most experienced personnel become senior analysts by accepting positions in other firms.

### **Education, Training, and Hiring Requirements**

Financial analysts must be able to use a variety of research methods skillfully. They need a thorough understanding of corporate finance in order to interpret balance sheets, profit and loss statements, marketing studies, and long-range plans. For these reasons, the master's degree in business administration (MBA) is replacing four-year degrees in business or economics as the degree of choice among employers.



This occupation requires strong math skills and the ability to speak, think, and write clearly. Formal training on the job consists of six months of direct supervision by a senior analyst. Success depends on the ability to be persistent and thorough in completing research projects, as well as the ability to absorb the amount of new information constantly entering the fast-paced environment. Analysts need the broad perspectives on the economy provided by course work in business cycles, economic history, money and banking, trading and investment.

A student considering the field is encouraged to seek out pre-professional summer, intern, and co-op opportunities, either as a runner in a stock exchange or an assistant in a brokerage firm or investment department of a bank. If it is financially possible, students can gain valuable experience by researching companies and purchasing a few shares of the so-called "penny stocks" and monitoring their own investments.

### **Industries That Employ Financial Analysts**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
628	Security and Commodity Services	38.0
602	Commercial Banks	20.0
631	Life Insurance	14.0
621	Security Brokers and Dealers	7.0

### **Occupational Earnings**

Starting salaries for financial analysts range from \$20,000-\$27,000 per year, depending upon the firm and the degree required.

### **Employment Outlook**

The outlook for financial analyst positions is expected to remain favorable for the next several years. Over 1,300 people were employed in this occupation in Massachusetts during 1984. This figure is expected to grow by about 26 percent by the year 1995. Expansion in this occupation will depend on growth in the business sector and on whether individuals, governments, and corporations have money to invest.

Average employment growth is expected for financial analysts. The need for sound financial advice brought about by increasing competition, changing laws regarding taxes and other financial matters, growing emphasis on the accuracy of financial data, and the increasing variety and complexity of financial services will spur the demand for financial analysts. However, the use of computers should make analysts more productive, resulting in an average growth range.

**Related Occupations****Treasurer****Credit Analyst****Risk and Insurance Manager****Institutions Providing Training in Massachusetts***Four-Year (Bachelor's) Degree:*

**American International College**  
1000 State Street  
77 Massachusetts Avenue  
Springfield, MA 01109  
(413) 737-7000

**Anna Maria College**  
Sunset Lane  
Paxton, MA 01612  
(508) 757-4586

**Assumption College**  
500 Salisbury Street  
Worcester, MA 01609  
(508) 752-5615

**Atlantic Union College**  
South Lancaster, MA 01561  
(508) 365-4561

**Babson College**  
Babson Park  
Wellesley, MA 02157  
(617) 235-1200

**Bentley College**  
Beaver and Forest Streets  
Waltham, MA 02254  
(617) 891-2244

**Berkshire Christian College**  
200 Stockbridge Road  
Lenox, MA 01240  
(413) 637-0838

**Massachusetts Institute of Technology**  
Cambridge, MA 02139  
(617) 253-4791

**Merrimack College**  
North Andover, MA 01845  
(508) 683-7111

**Nichols College**  
Dudley, MA 01570  
(508) 943-2055

**North Adams State College**  
Church Street  
North Adams, MA 01247  
(413) 664-4511

**Northeastern University**  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2200

**Pine Manor College**  
400 Heath Street  
Chestnut Hill, MA 02167  
(617) 731-7104

**Regis College**  
235 Wellesley Street  
Weston, MA 02193  
(617) 893-1820

Boston College  
Lyons Hall 120  
Chestnut Hill, MA 02167  
(617) 552-3100

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2300

Bradford College  
320 South Main Street  
Bradford, MA 01830  
(508) 372-7161

Bridgewater State College  
Tillinghast Hall  
Bridgewater, MA 02324  
(508) 697-1237

Clark University  
950 Main Street  
Worcester, MA 01610  
(508) 793-7431

Curry College  
Milton, MA 02186  
(617) 333-0500

Eastern Nazarene College  
23 East Elm Avenue  
Wollaston, MA 02170  
(617) 773-2373

Elms College  
291 Springfield Street  
Chicopee, MA 01013  
(413) 598-8351

Emmanuel College  
400 The Fenway  
Boston, MA 02115  
(617) 277-9340

Salem State College  
352 Lafayette Street  
Salem, MA 01970  
(508) 745-0556

Simmons College  
300 The Fenway  
Boston, MA 02115  
(617) 738-2107

Southeastern Massachusetts  
University  
Old Westport Road  
North Dartmouth, MA 02747  
(508) 999-8605

Springfield College  
263 Alden Street  
Springfield, MA 01109  
(413) 788-3136

Stonehill College  
Washington Street  
North Easton, MA 02356  
(508) 238-1081

Suffolk University  
Beacon Hill  
Boston, MA 02108  
(617) 723-4700

University of Lowell  
One University Avenue  
Lowell, MA 01854  
(508) 452-5000

University of Massachusetts--  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222



Fitchburg State College  
160 Pearl Street  
Fitchburg, MA 01420  
(508) 345-2151

Framingham State College  
120 State Street  
Framingham, MA 01701  
(508) 620-1220

Gordon College  
255 Grapevine Road  
Wenham, MA 01984  
(508) 927-2300

Lesley College  
29 Everett Street  
Cambridge, MA 02238  
(617) 868-9600

University of Massachusetts--  
Boston  
Harbor Campus  
Boston, MA 02125  
(617) 929-7102

Western New England College  
1215 Wilbraham Road  
Springfield, MA 01119  
(413) 782-3111

Worcester Polytechnic Institute  
Worcester, MA 01609  
(508) 793-5286

Worcester State College  
486 Chandler Street  
Worcester, MA 01602  
(508) 793-8040

## **Securities or Financial Sales Worker**

Securities broker, financial consultant, and account executive are some of the titles used to identify people who sell securities for brokerage and investment firms. Traditionally, stockbrokers have bought and sold stocks and bonds for individual and institutional investors, kept clients abreast of market developments, and helped them manage their investments wisely. Since the financial services industry has expanded so greatly in recent years, this definition is no longer exclusively true. More people with more money to invest have created intense competition among financial service companies for investor dollars. The result has been the development of new investment strategies and a whole range of money management methods. Deregulation of the banking industry has opened the way for investment firms to offer products and services formerly reserved by banks. In addition to trading stocks, bonds, and commodities, the traditional stockbroker has become a financial consultant, offering advice and services not only about investments but also about loan plans, checking services and long-term financial security.

The emphasis in all of these job titles is sales. Using a variety of creative techniques, securities sales workers develop new business for their companies. They obtain customers through referrals, formal presentations to individuals and businesses, professional networks, and direct mail. For example, an account executive may "cold



call" individuals who meet certain income criteria to interest them in the company's services. Once the account executive interests a new client, the executive conducts a financial analysis, develops an appropriate financial plan, and executes the transactions necessary to implement that plan. The executive calculates transaction costs, buys and sells the desired investments, records sales, monitors market conditions, and helps the client develop a profitable investment portfolio. In today's multi-service market, the account executive will also try to interest clients in the full range of financial products offered by the firm.

Securities sales is an active, high pressure occupation. Brokers read constantly – business publications, stock reports, and newsletters – to keep up-to-date and ahead of the competition. Entry-level starting salaries range from \$16,000 to \$24,000 per year, depending upon background and experience. New hires typically spend the first few weeks on the job studying for the federal broker's exam, which must be passed before officially entering the field. On-the-job training can last a year and a half. Sometime during the first year, the salary is gradually withdrawn and replaced by a commission on sales. In order to succeed, brokers need to be highly motivated, resilient and, in the words of one expert, "tenacious." It is not unusual for individuals in this occupation to work fifty or sixty hours per week.

Financial sales representatives work for banks and savings and loan associations and sell a wide variety of banking services to industrial, commercial, and individual customers. These sales representatives approach their work in ways which are similar to those of securities brokers. They develop leads on prospective customers, assess client needs and develop packages of financial services based on those needs.

### **Education, Training, and Hiring Requirements**

Some firms recruit candidates with bachelor or M.B.A. degrees directly from colleges and universities. Other firms prefer to hire mature sales personnel who have had the benefit of several years' experience in a company with a well-respected sales training program. Several personal interviews, a writing sample, and a battery of tests, including a psychological profile, may be part of the recruitment process. Training during the first six months often includes instruction on product lines and telemarketing techniques. After the initial training period, sales personnel may occasionally take refresher courses offered by the company.

## **Industries That Employ Securities and Financial Sales Workers**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
621	Security Brokers and Dealers	67.0
602	Commercial Banks	13.4
628	Security and Commodity Services	9.4
616	Mortgage Bankers and Brokers	4.2
614	Personal Credit Institutions	3.2

### **Occupational Earnings**

Entry-level salaries range from \$16,000 to \$24,000 per year, depending on background and experience.

### **Employment Outlook**

Securities and financial sales are among the six fastest growing sales occupations in Massachusetts. In 1984 there were nearly 6,000 people employed under this heading in the state. An anticipated growth rate of 35 percent or more will be fueled by rising incomes and an increasing awareness of the need for individual financial planning. As for other components of the service sector, some of the increased demand will come from dual wage earner families who are accustomed to contracting for professional services.

Employment of securities and financial sales workers is expected to grow much faster than average as economic growth, rising personal incomes, and greater inherited wealth increase the funds available for investment. As banks and credit institutions expand the financial services they offer, and issue more loans for personal and commercial use, more of these workers will be needed.

Competition for securities sales training -- positions particularly in large firms -- is keen because of the potentially high earnings. Job opportunities should be best for mature individuals with successful work experience. Opportunities for inexperienced sales representatives should be best in smaller firms.

### **Related Occupations**

Securities Advisor

Futures Broker

## **Institutions Providing Training in Massachusetts**

### ***Four-Year (Bachelor's) Degree:***

Babson College  
Mustard Hall  
Babson Park, MA 02157  
(617) 235-1200

### **Where to Write for More Information:**

Securities Industry Association  
120 Broadway  
New York, NY 10271

## **Food Service Worker**

Food service positions are found in restaurants of all kinds, in catering firms, institutional settings such as office buildings, schools and colleges, in health care facilities, in hotels, airports, department stores and related settings. Positions involve the preparation and serving of food and range from categories which require no formal education or training -- waitstaff, bartender, cashier and host/hostess, to skilled occupations -- cook, chef, assistant manager, manager and food and beverage director -- which may require both formal and on-the-job training.

A career in the culinary area of food service can begin at the level of assistant cook or cook and from there progress through sous chef, chef and assistant manager to director of food and beverage. From bussing and waitstaff positions, promotional opportunities in restaurant operations can range from host/hostess, bookkeeper, supervisor and assistant manager to manager. As with the lodging side of hospitality, rotation through several departments is an important prerequisite for advancement into management.

In 1984 over 200,000 people in Massachusetts worked in food service occupations. Employment is largely concentrated in eating and drinking establishments, hotels and air transportation services.



## **Industries That Employ Food Service Workers**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
581	Eating and Drinking Places	66.4
701	Hotels and Motels	9.8
805	Nursing and Personal Care Facilities	4.3
596	Nonstore Retailers	3.2
821	Elementary and Secondary Schools	3.1
822	Colleges and Universities	2.6
806	Hospitals	2.1
799	Miscellaneous Amusement, Recreation Services	1.9
832	Individual and Family Services	1.2

According to the National Institute for the Foodservice Industry (NIFI), supervisory jobs are plentiful for graduates of two year colleges, while management positions increasingly require both a four year degree and familiarity with computers. Designing a satisfying career in food service, as in other areas of hospitality, requires combining liberal amounts of experience and determination with formal education or training.

### **Occupational Earnings**

Entry level food service workers start at \$4.00 to \$4.50 per hour. Those with experience earn \$6.00 or more per hour.

### **Employment Outlook**

Many of the fastest growing job categories in the Commonwealth are in food service. Although some of these are replacement jobs which are attributable to high turnover, a significant number of new jobs will be created by expansion in the industry. The most active job titles include: restaurant manager, cook, baker, host/hostess, bartender, dining room attendant, waitstaff, fast food preparer/server, sandwich maker and kitchen helper. Several of these occupations are described below.

### **Related Occupations**

Kitchen Helper

Butcher

Pantry Goods Maker



## **Institutions Providing Training in Massachusetts**

Assabet Valley Regional Vocational  
School  
Fitchburg Street  
Marlboro, MA 01752  
(508) 485-9430

Bunker Hill Community College  
New Rutherford Avenue  
Charlestown, MA 02129  
(617) 241-8600

Creative Cuisine  
2020 Massachusetts Avenue  
Cambridge, MA 02140  
(617) 354-3836

Essex Agricultural & Technical  
Institute/Collegiate Division  
Route 62  
Danvers, MA 01923  
(508) 774-0050

Greenfield Community College  
One College Drive  
Greenfield, MA 01301  
(413) 774-3131

Holyoke Community College  
303 Homestead Avenue  
Holyoke, MA 01040  
(413) 538-700

Laboure Junior College  
2120 Dorchester Avenue  
Boston, MA 02124  
(617) 296-8300

Massosoit Junior College  
One Massosoit Boulevard  
Brockton, MA 02402  
(508) 588-9100

Minuteman Vocational Technical  
School  
758 Marrett Road  
Lexington, MA 02173  
(617) 861-6500

Newbury Junior College  
921 Boylston Street  
Boston, MA 02115  
(617) 262-9350

Northern Essex Community College  
100 Eliot Street  
Haverhill, MA 01830  
(508) 374-3600

Quincy Junior College  
34 Coddington Street  
Quincy, MA 02169  
(617) 984-1600

### ***Vocational Education Programs:***

See Appendix C

## **Gardener or Groundskeeper**

Gardeners and groundskeepers work at parks and campgrounds, golf courses, private homes, nurseries, cemeteries, schools, buildings, and just about any other place where there are plants. These workers may be employed by local, state, and federal governments, individual homeowners, landscaping firms, groundskeeping companies, or nurseries. They may be self-employed or may work for any company that has grounds at its place of business. Regardless of where or for whom gardeners and groundskeepers work, they all have two things in common: the work is strenuous and, during certain times of the year, the hours are long.

The exact job duties of gardeners and groundskeepers vary according to whom they work for. Working at a nursery entails different duties from working at a private home. In general, gardeners and groundskeepers mow lawns; trim and edge grass around sidewalks, curbs, and flower beds; prune and trim shrubs, bushes, and trees; fertilize and water plants; and weed flower beds. In the fall, raking and burning or carrying away leaves are added to their duties; in the spring, planting is added. Many gardeners and groundskeepers pick up litter and debris from the grounds.

A person who works for a nursery does more planting, potting, and overall maintenance of plants and very little mowing and leaf raking. A nursery worker also carries plants and trees from the nursery to customers' cars. Working for a landscaper entails planting and uprooting trees, shrubs, and other plants, as well as using a wheelbarrel to move rocks, gravel, and soil.

Gardeners and groundskeepers who work at parks and campgrounds are usually employed by the local, state, or federal government. They are assigned to teams. Each day, the teams visit one or more parks and campgrounds and perform several tasks, depending upon the condition of the grounds and the time of year. Every visit includes picking up litter and cleaning the facilities. If the grass is too long, the workers cut it with a manual or power mower or a tractor with a mowing attachment. During the spring, under the direction of a horticulturist, groundskeepers may cut down diseased trees or limbs and plant flowers, grass, trees, and other plants. In the fall, groundskeepers rake leaves by hand or with a gas-powered leaf blower and paint any building that needs it. In some instances, a groundskeeper lives at the campground and is in charge of the complete maintenance of the camp.

Self-employed gardeners and groundskeeping companies contract work from private homeowners, businesses, and building management firms. These workers visit the job site once a week to weed flower beds, mow the lawn, and edge and trim around sidewalks and curbs. Occasionally, depending on the time of year, they plant flowers, rake leaves, and fertilize the lawn.

In some instances, self-employed gardeners or groundskeeping companies subcontract work from a landscaper. During these times, they plant or remove trees, shrubs, bushes, grass, flowers, and other plants as directed by the landscaper. Using a wheelbarrow, they may also move large amounts soil, rocks, and gravel from a pile to an area directed by the landscaper and spread it with rakes and shovels. Hoes, spades, saws, axes, and other tools are also used by gardeners and groundskeepers in the course of completing their duties.

Sometimes, owners of buildings or management firms employ a groundskeeper to do simple daily maintenance (such as raking leaves, mowing and watering the lawn). Large institutions such as hospitals, schools, colleges, and apartment complexes employ large groups of groundskeepers to maintain the grounds. The groundskeepers may also be required to do some painting of fences and walls and to remove snow from walks and parking lots during the winter.

Country clubs employ gardeners and groundskeepers who work under the supervision of a head greenskeeper. They water and fertilize the golf course, rake sand traps, and move holes on greens at the direction of the greenskeeper.

Gardening and groundskeeping is ideal work for men and women who enjoy working outside and with their hands. The work can be very rewarding, as the results of the hard work can be seen immediately.

Gardening and groundskeeping is seasonal work. During the spring, summer, and fall, work is abundant; but during the winter, there is very little. The only work needed in the winter is cleaning up litter, shoveling snow from walkways, and caring for indoor plants. If full-time work is desired, workers may have to find temporary jobs during the colder months of the year.

### **Education, Training, and Hiring Requirements**

Training for gardening and groundskeeping is done on the job. No formal education is required, although most employers prefer workers with a high school diploma or its equivalent. The only hiring requirements are a good work record and physical ability. (The work can be very strenuous.)

Most workers in this field begin as laborers. They perform simple tasks, such as raking, digging, watering, and mowing, which can be learned in a few hours. The typical method of training is for new workers to work alongside more experienced workers and to learn by observing. As time goes on, they are exposed to more complex tasks such as fertilizing and planting.

It only takes a few hours to learn a laborer's job, and a groundskeeper's position takes a few months. But much training is required for individuals who want to progress in this field. Gardeners and supervisors must develop an understanding of the



different types of flowers, trees, grasses, and other plants. They need to know when, how, and where to plant them. They must learn about fertilizers -- what type to use, how much to use. And most importantly, they need to develop an understanding of landscape design. Individuals wanting to make a career in gardening and groundskeeping are encouraged to seek a place of employment that will provide a broad range of duties and exposure to many different types of plants.

Formal training is available to those who want to further their careers in this field. Courses on landscape design are offered at local junior colleges, colleges and universities, and adult learning centers. Self-study books are available in abundance on subjects pertaining to gardening and groundskeeping. More thorough training may be obtained by working for an experienced gardener or groundskeeper in an apprenticeship fashion. (No formal apprenticeship exists for gardening or groundskeeping in Massachusetts.) Though additional training is not required in this job, it can lead to self-employment, a supervisory position, or a greenskeeper position.

### **Industries That Employ Gardeners and Groundskeepers**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
903	Local Government	14.2
655	Subdividers and Developers	10.9
822	Colleges and Universities	8.0
651	Real Estate Operators and Lessors	6.7
653	Real Estate Agents and Managers	4.6
806	Hospitals	4.0
821	Elementary and Secondary Schools	3.7
701	Hotels and Motels	3.0
526	Retail Nurseries and Garden Stores	1.6
673	Trusts	1.6

### **Occupational Earnings**

Gardeners and groundskeepers are usually paid an hourly wage, although self-employed gardeners are paid in a lump sum or in installments for their services. The typical gardener or groundskeeper earns between \$6.00 and \$7.00 per hour, after starting at a wage of about \$5.50. More experienced gardeners and groundskeepers may earn up to \$15.00 per hour.



## **Employment Outlook**

Employment of gardeners and groundskeepers is expected to grow faster than the average through the year 2000. Rising incomes, new housing, and trends toward property enhancement will propel that growth. Most of the job growth, however, is expected to be seasonal in nature.

## **Related Occupations**

Laborer

Landscaper

Landscape Architect

Greenskeeper

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Becker Junior College--Leicester  
3 Paxton Street  
Leicester, MA 01524  
(617) 892-8122

Essex Agricultural and Technical  
Institute/Collegiate Division  
Route 62  
Danvers, MA 01923  
(617) 774-0050

Springfield Technical Community  
College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

University of Massachusetts  
Stockbridge School of Agriculture  
Amherst Campus  
Amherst, MA 01002  
(413) 545-0111

### *Vocational Education Programs:*

See Appendix C

## General Office Clerk

Organizations that handle large volumes of money, data, or administrative records need clerical assistants to process, store, and retrieve information about business activities. General office clerks receive payments and documents, record information according to established methods, and maintain files either normally or with computers. General office clerks differ from other groups of clericals whose jobs have evolved into distinct specialties within departments or industries, as with personnel clerks, bank tellers, and brokerage clerks. Depending upon the organization, general office clerks perform administrative tasks such as bill paying, data entry, filing (although this is less true in automated offices), mailing, and photocopying. Dealing with the public, office clerks may check forms for accuracy, accept payments, explain policies, or handle complaints. They may also operate business machines such as photocopiers, calculators, and posting machines and do light typing. Office clerks differ from secretaries because they function on behalf of an entire department or organization rather than as assistants to one or more individuals, but these distinctions may blur depending upon the setting.

### Education, Training, and Hiring Requirements

Employers prefer high school graduates for clerk positions. Applicants who have taken business courses such as typing or business math and who are detail-oriented and accurate will be the most successful.

### Industries That Employ General Office Clerks

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
902	State Government	6.9
602	Commercial Banks	5.7
903	Local Government	5.2
481	Telephone Communication	4.6
631	Life Insurance	3.7
736	Personnel Supply Services	3.6
806	Hospitals	3.3
821	Elementary and Secondary Schools	3.2
822	Colleges and Universities	1.9
551	New and Used Car Dealers	1.7

## **Occupational Earnings**

Workers in this occupation earn about the same wage as receptionists -- around \$200 a week to start. Experienced clerks can earn as much as \$300 per week depending upon the industry, size, and geographic location of the firm.

## **Employment Outlook**

Opportunities for general office clerks are expected to grow at a modest rate. The demand for file clerks, statistical clerks, and timekeepers, on the other hand, will decline as computerized systems move businesses toward the "paperless office" and new software such as Lotus 1-2-3 perform calculations automatically.

Average employment growth is expected in this field but because of the higher than average turnover in this very large occupation many replacement openings will be created.

As more and more offices are automated, managers are recognizing that flexibility of their work force is necessary to increase efficiency, and a growing number of employers are showing a preference for office generalists. As office equipment becomes simpler to use, general office clerks can be expected to do an ever greater variety of tasks.

Because they are clerical "jacks-of-all-trades," general office clerks find work in virtually every kind of industry. However, jobseekers who have typing and other secretarial skills and are familiar with a wide range of office machines have the best opportunities.

## **Related Occupations**

Administrative Clerk

Police Aide

Ward Clerk

Career Guidance Technician

## **Institutions Providing Training in Massachusetts**

Berkshire Community College  
West Street  
Pittsfield, MA 01201  
(413) 499-4660

Mount Wachusett Community  
College  
Green Street  
Gardner, MA 01440  
(508) 632-6600

Bristol Community College  
777 Elsbree Street  
Fall River, MA 02720-7395  
(508) 678-2811

North Shore Community College  
3 Essex Street  
Beverly, MA 01915  
(508) 922-6722



Bunker Hill Community College  
New Rutherford Avenue  
Boston, MA 02129  
(617) 241-8600

Cape Cod Community College  
West Barnstable, MA 02668  
(508) 362-2131

Greenfield Community College  
One College Drive  
Greenfield, MA 01301  
(413) 774-3131

Holyoke Community College  
303 Homestead Avenue  
Holyoke, MA 01040  
(413) 538-7000

Massachusetts Bay Community College  
50 Oakland Street  
Wellesley Hills, MA 02181  
(617) 237-0165

Massasoit Community College  
One Massasoit Boulevard  
Brockton, MA 02402  
(508) 588-9100

Middlesex Community College  
Springs Road  
Bedford, MA 01730  
(617) 275-8910

Northern Essex Community College  
Elliot Way  
Haverhill, MA 01830  
(508) 374-3600

Quinsigamond Community College  
670 West Boylston Street  
Worcester, MA 01606  
(508) 852-6365

Roxbury Community College  
625 Huntington Avenue  
Boston, MA 02115  
(617) 734-1960

Springfield Technical Community  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

Whittier Vocational School  
115 Amesbury Line Road  
Haverhill, MA 01830

Minuteman Vocational Technical  
School  
758 Marrett Road  
Lexington, MA 02173

Greater New Bedford Technical  
1121 Ashley Boulevard  
New Bedford, MA 02745

## Glazier

The origin and use of glass can be traced back over 5,000 years. Today glass serves many purposes. Insulated glass keeps in warmed or cooled air. Tempered and wired glass make doors and windows more secure. Large glass panels are used in modern construction to give the architecture a distinctive look and to reduce the need for artificial lighting.

Most glaziers are construction workers who cut and set glass in openings (such as storefronts, windows, showcases, and skylights) or on flat surfaces (like ceilings and building fronts). For most jobs, the glass is precut and mounted in metal frames at a factory; but glaziers may need to bolt metal hinges, handles, and locks to prefabricated glass doors and windows. For certain projects, glaziers may install structural glass to ornament building fronts, walls, or ceilings. They may use a crane or a hoist with suction cups attached to lift large, heavy pieces of glass.

Glaziers still need to be skillful in cutting glass to exact measurements, especially for repair and alteration jobs. Glass is cut by scoring with a glass-cutting tool and a straight edge; then it is broken along the line by tapping the glass lightly with the cutter handle or by applying leverage with hands or pliers. Curved cuts are made by using a template or following a pattern laid under the glass. Putty, mastics (pasty materials used as cement), and special adhesive tapes are used in installation to secure the glass.

Automobile glass installation is another allied profession that uses the skills of a glazier. Installers may work for a dealership or for a repair shop. They typically replace damaged windshields, door windows, and sun roofs.

Glaziers in construction are outdoors a great deal, although they do much of their work inside buildings. Occasionally they must work on scaffolds at great heights. They may find that their work entails considerable bending, stooping, lifting, and standing. Those who do metalwork are essentially benchworkers. Glaziers who grind and polish glass in shops may need to wear waterproof aprons since water is used for these operations.

In the construction field, glaziers usually travel to various job sites, but fortunately this trade tends to be less seasonal than some other building trades. Glaziers also have the option of doing indoor installation and repair work.

Work-related injuries due to broken glass, tools, and equipment and scaffolding falls have lessened as a result of new safety gear and stronger safety precautions.

### **Education, Training, and Hiring Requirements**

Glazing is a skilled trade. Workers usually learn this craft through a three- to four-year apprenticeship program. Some glaziers, however, pick up the skill informally by working as helpers and observing experienced workers. Most apprentices are high school graduates between the ages of eighteen and twenty-six. They should have stamina and good manual dexterity.

Federal and state regulations require that glaziers have a working knowledge of safety laws. They must know the qualifications for safety glazing materials and which installations or places require them.

Although glaziers may advance to supervisory jobs or become contractors, the field is very competitive and managerial skills are needed to be successful.

### **Industries That Employ Glaziers**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
179	Miscellaneous Special Trade Contractors	65.6
523	Paint, Glass, Wallpaper Stores	23.7
503	Lumber and Construction Materials	3.9

Glaziers most often work for independent contractors engaged in new construction or repair and remodeling work. Some work for large businesses and government agencies as in-house glaziers. Others work in factories that manufacture glass and glass products or for companies that install or replace glass in automobiles.

### **Occupational Earnings**

Glaziers can earn between \$400 and \$500 per week.

### **Employment Outlook**

Glass has become an increasingly important material in new construction. Energy-efficient buildings require the installation of large glass panels to capture solar energy. In addition, as development continues in Massachusetts, glaziers will be needed for the installation and replacement of glass.

Employment growth of glaziers will be average and should result from the increasing use of glass for new residential and commercial buildings and the need to replace glass. However, because this occupation is fairly small, only a limited number of jobs will become available.



Those wishing to enter glazing apprenticeships may face competition for the limited openings because high wages and all around training opportunities attract many people to these programs.

### **Related Occupations**

Safety Glass Installer

Metal Furniture Glazier

Windshield Installer

Refrigerator Glazier

### **Institutions Providing Training in Massachusetts**

Glaziers and Glassworkers Local No. 1044

718 Huntington Avenue

Boston, MA 02115

(617) 731-6800

### **Where to Write for More Information**

International Brotherhood of

Painters and Allied Trades

1750 New York Avenue, N.W.

Washington, D.C. 20006

Membership Services

National Glass Association

8200 Greensboro Drive

McLean, VA 22102

## **Home Entertainment Equipment, Appliance, and Power Tool Repairer**

Home entertainment equipment, appliance, and power tool repairers repair and adjust common household products. Working in repair shops or at customers' homes, these service technicians, as they are usually called, repair such home entertainment equipment as radios, televisions, stereo equipment, video recorders, compact disc players, and video games. Technicians specializing in appliances repair power mowers, hedge trimmers, microwave ovens, washers and dryers, vacuum cleaners, dishwashers, and other major appliances found in and around the home. Technicians may work in small repair shops or the repair department of major department stores, specialized dealers, or manufacturers. They may also be self-employed.

When a piece of equipment fails to operate properly, the service technician begins by conducting routine checks for common sources of trouble such as faulty electrical connections. If the routine checks do not locate the trouble, the technician refers to wiring diagrams, schematics, service manuals, and troubleshooting guidelines that show electrical connections and provide instructions on how to locate problems.

In most cases, the service technician disassembles the equipment and tests the electrical system by using wiring diagrams and testing equipment such as voltmeters, oscillators, signal generators, ammeters, watt meters, and frequency counters.

After the problem has been diagnosed and located, the technician must decide whether to adjust the faulty part or replace it. For example, a television set may need a circuit board replaced or the set may only need simple adjustments to focus the picture and correct the color balance. On a large appliance, a belt may need to be replaced or tightened.

When removing old parts and installing new ones, technicians use common hand tools including screwdrivers, soldering guns, pliers, and wire cutters, as well as special tools designed for the appliance or equipment. After technicians make the needed repairs, they test the equipment to ensure it is operating properly.

In addition to repairing home equipment and appliances, service technicians frequently answer customers' questions and complaints and advise them on the proper use and care of the equipment. Technicians also give estimates on repair costs, calculate charges, and often collect payment.

Repair shops are usually quiet, very clean, and well lit and ventilated. Working conditions outside the shop vary. In many instances, the service technician works inside a customer's house where the conditions can be quite nice. At other times, the repair job may be performed in the basement or garage, where conditions can be cramped and uncomfortable as well as dirty and dusty. If the technician specializes in home repair, several hours per day are spent on the road. Regardless of location, a service technician typically works alone and unsupervised.

The work is usually very safe. But workers must follow safety precautions to prevent electrical shock and to avoid strain from lifting heavy appliances and equipment. Most service technicians come in frequent contact with customers who, at times, may be upset. Courtesy and tact are very important in these instances.

### **Education, Training, and Hiring Requirements**

Hiring requirements vary a great deal in this occupation, depending upon the appliance, power tool, or entertainment equipment a technician is specializing in. The requirements range from a basic understanding of electronics and mechanics to a broad understanding of electronics theory. Some training in electronics or mechanics, acquired formally or on the job in a related occupation, is generally required to get an entry-level job in this field. One to two years of courses in math, physics, schematic reading, electricity, and electronics at a high school, vocational school, or community college are extremely helpful, as well as hands-on training. The military services also offer training and work experience that are very useful in civilian electronics work.

Some employers, in cooperation with trade unions, provide apprenticeships in the repair of home entertainment and electrical equipment. Apprenticeships combine on-the-job training and classroom instruction to give a broad and thorough understanding of the field. These apprenticeships usually last between two and four years.

Regardless of how much formal and on-the-job training a new employee has received, employers usually provide additional training. In small repair shops, new employees work on a single appliance or piece of equipment until they have mastered it. Then they move on to another. New repairers in the field receive training as they assist more experienced technicians. Large companies and repair shops provide formal in-house training and home study manuals.

New technicians are taught to locate basic controls from schematics or drawings, to analyze and determine a problem, and to decide whether to replace or repair a faulty part. On-the-job training for new employees may take as long as three years before they are fully competent service technicians.

Even after on-the-job training has been completed, service technicians (especially those specializing in the repair of electronic equipment) are constantly being trained to keep abreast of new products and technological changes. These changes occur so frequently that technicians who do not keep up can soon find their skills obsolete. Technicians are usually able to keep pace with new products and improvements in technology in two ways. They attend training seminars conducted by manufacturers, employers, and trade associations; and they study manufacturers' service manuals and read technical manuals.

In addition to previous training, most employers look for individuals with good eyesight and color perception, normal hearing, and good hand-eye coordination. Mechanical aptitude is very helpful. Courtesy and tact are needed when dealing with customers.

After gaining experience as service technicians, workers may eventually become supervisors or service managers. Individuals specializing in the repair of home entertainment equipment may become troubleshooters with additional courses in automatic controls, electronic engineering, and math. Many service technicians choose self-employment and open their own repair shops. Still others leave this field and go into related occupations.



## **Industries That Employ Home Entertainment Equipment, Appliance, and Power Tool Repairers**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
573	Radio, Television, and Computer Stores	45.3
762	Electrical Repair Shops	22.0
506	Electrical Goods	16.6

### **Occupational Earnings**

Earnings for service technicians vary widely according to their level of skill. Trainees earn between \$10,000 and \$18,000 per year. More experienced repairers earn \$16,000 to \$22,000, while highly skilled service technicians earn as much as \$30,000 per year.

### **Employment Outlook**

Average growth is expected for this occupation, in response to the growing number of appliances and home entertainment products in use. Population growth and rising incomes will contribute to the growth. Nevertheless, the need to replace workers who leave the occupation will account for most of the job openings. Because experience in the repair of appliances, power tools, and home entertainment equipment is good preparation for jobs in related occupations, an unusually large number of workers in this field transfer to other occupations.

### **Related Occupations**

Computer Service Technician	Heating, Air Conditioning, and Refrigeration Mechanic
Commercial and Industrial Electronic Equipment Repairer	Vending Machine Servicer and Repairer
Broadcast Technician	
Office Machines and Cash Register Servicer	

### **Institutions Providing Training in Massachusetts**

Baystate School of Appliances  
15 Everett Street  
Boston, MA 02136  
(617) 364-3434

Radio Electronic Television  
School  
965 Commonwealth Avenue  
Boston, MA 02215  
(617) 783-1197

Northeast Institute of Industrial  
Technology  
41 Phillips Street  
Boston, MA 02114  
(617) 523-2813

### **Where to Write for More Information:**

#### **Electronic Home Entertainment Equipment**

National Association of Television  
and Electronic Servicers of  
America (NATESA)  
4621 N. Kedzie Avenue  
Chicago, IL 60629

Electronics Industries Association  
2001 Eye Street, N.W.  
Washington, D.C. 20006

National Electronic Sales and  
Service Dealers Association  
and the International Society  
of Certified Electronics  
Technicians  
2708 West Berry Street  
Fort Worth, TX 76109

#### **Home Appliances and Power Tools**

Association of Home Appliance  
Manufacturers  
20 N. Wacker Drive  
Chicago, IL 60606

International Brotherhood of  
Electrical Workers  
1125 15th Street, N.W.  
Washington, D.C. 20005

Appliance Service News  
P.O. Box 789  
Lombard, IL 60148

### **Home Health Aide**

Home health aides administer personal care and perform light household work for patients in their homes. Services are assigned by each patient's primary nurse and thus vary from patient to patient; but they often include bathing and grooming, changing bedpans, helping patients to move or exercise; taking temperature, pulse, and blood pressure readings; changing dressings; buying food and preparing meals; changing sheets; doing laundry and light housekeeping.

A full-time home health aide would see between six and eight patients a day. The majority of home health aides, however, work part-time, on a call-in basis. Aides tell their employing agencies how much they would like to work, and the agencies

schedule visits accordingly. Home health aides are responsible for their own transportation from patient to patient and are usually not paid for travel time. Most agencies will schedule appointments in restricted areas that the aide designates.

In Massachusetts in 1984, 4,700 home health aides were employed mostly by visiting nurse associations (VNAs) and home health agencies. Full-time home health aides usually get health insurance and other benefits; the majority, who work part-time, do not. Agencies are now having difficulty filling the demand for home health aides and may begin to offer benefits to part-timers as a recruitment strategy.

### **Education, Training, and Hiring Requirements**

To practice, home health aides must complete a short training program approved by the Massachusetts Department of Public Health. Most VNAs and home health agencies have their own approved training programs, which usually last two weeks. It is common practice for agencies to hire aides without the training and to pay them while they are going through the two-week program. For those without this training, jobs as homemakers are available, for which responsibilities are more restricted and wages are slightly lower.

Home health aides must find it gratifying to work with the sick. They must be patient, flexible, compassionate, and supportive. Many patients are not only sick but also very poor, and home health aides must be able to deal with the stress that may arise out of these conditions.

Within the occupation, mobility is limited, except to move from a part-time, call-in aide to a full-time staff aide with an agency. Staff aide jobs provide slightly higher wages, as well as benefits and paid vacations. In large agencies, home health aides can also move into more highly paid medical clerical work, such as taking referrals over the phone or coordinating aide visits and schedules. Upward mobility on a clinical career path requires further education. The closest career step would be toward a job as a licensed practical nurse, which requires at least one year of further training.



## **Industries That Employ Home Health Aides**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
809	Health and Allied Services	62.2
832	Individual and Family Services	28.4
839	Social Services	5.1
808	Home Health Care Services	2.1
806	Hospitals	1.2

### **Employment Outlook**

Job prospects for home health aides are expected to be excellent through the mid-1990s. Increased pressure to contain costs is making hospitals discharge patients earlier, and leading to a growing demand for home health care. There are now many more jobs for home health aides than there are aides to fill them. If this shortage persists, it may exert some upward pressure on wages and the availability of benefits.

### **Occupational Earnings**

Wages for home health aides range from \$4.80 to \$6.30 an hour.

### **Employment Outlook**

The employment of home health aides is expected to grow much faster than average due to the substantial increase in the frail elderly population in the years immediately ahead and the burgeoning efforts to care for chronically ill children at home. In addition, the growing need and availability of in-home services, due in part to the growing concern about the cost of hospital care, will further job opportunities for home health aides.

## **Institutions Providing Training in Massachusetts**

### *Vocational Education Programs:*

See Appendix C

### **Where to Write for Further Information:**

American Hospital Association  
Division of Nursing  
840 North Lake Shore Drive  
Chicago, IL 60611

American Health Care Association  
1200 15th Street, N.W.  
Washington, D.C. 20005

## Hotel Desk Clerk

Most people in the hospitality field agree that the place to learn the lodging business is at the front desk of a hotel. Front desk clerks or assistants make reservations, greet and register guests, handle their problems or complaints, process room charges, and generally acquaint visitors with the services of the hotel, motel, or inn. Front desk work involves interaction with other departments such as housekeeping, room service, catering, and conference services and provides entry-level employees with an understanding of how these units function independently and as a whole.

### Education, Training, and Hiring Requirements

Front desk experience is important for anyone considering a career in hotel management. Hotel and motel managers are usually chosen from among experienced personnel, and although a four-year degree is becoming the most desirable educational credential in the industry, it is not unusual to spend two to three years learning and later supervising operations before promotion into management. An employee who starts at the front desk, for example, may move laterally into reservations before supervising a "back of the house" unit like room service or housekeeping. Next may come a promotion to assistant manager in food and beverage, and possibly in other areas, before becoming a full-fledged manager. In the presence of formal training program, this kind of rotation usually proceeds according to a timetable. Where the promotional ladder is not as well defined, employees have to chart their own courses and negotiate each step personally. According to Rose Agrippino, Employment Manager with the Sheraton Boston Hotel, entry-level employees need to be patient and flexible. They need to invest in the long term, to stay as long as a year in each position before expecting a promotion to the next level.

### Industries That Employ Hotel Desk Clerks

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
701	Hotels and Motels	99.9

### Occupational Earnings

Front office positions can pay as much as \$8.00 an hour to start. High school or two-year college graduates who are interested in the field may find the shift work, coupled with the tuition waiver plans offered by a number of hotel chains, an ideal way to obtain both the experience and the education necessary for advancement.

## **Employment Outlook**

There were over 2,000 lodging clerks in Massachusetts in 1984. The outlook for the occupation is favorable, and hotels and motels are expected to actively recruit qualified workers for new and replacement jobs. Industry growth and the high turnover rate traditionally associated with these jobs may result in shortages in some areas. The need for workers and the high cost of turnover should result in improved salaries and working conditions for hotel support staff. The general manager of a suburban Boston hotel said recently, "We know how delicate holding onto employees is and will do whatever we can to keep the turnover rate to a minimum."

Employment of hotel desk clerks is expected to grow much faster than average as more large hotels and motels are built. Business travel will continue to grow, and increased domestic and foreign tourism will also create demand for additional hotels and motels.

## **Related Occupations**

Receptionist

Sales Clerk

Host and Hostess

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Bay State Junior College  
122 Commonwealth Avenue  
Boston, MA 02116  
(617) 236-8000

Holyoke Community College  
303 Homestead Avenue  
Holyoke, MA 01040  
(413) 538-7000

Berkshire Community College  
West Street  
Pittsfield, MA 021201  
(413) 499-4660

Newbury Junior College  
129 Fisher Avenue  
Brookline, MA 02146  
(617) 739-0510

Boston University  
Metropolitan College  
755 Commonwealth Avenue  
Boston, MA 02215  
(617) 353-2300

Northeastern University  
University College  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2400

Bunker Hill Community College  
New Rutherford Avenue  
Charlestown, MA 02129  
(617) 241-8600

Quinsigamond Community College  
670 West Boylston Street  
Worcester, MA 01606  
(508) 853-2300



Chamberlayne Junior College  
128 Commonwealth Avenue  
Boston, MA 02116  
(617) 536-4500

Travel School of America  
1047 Commonwealth Avenue  
Boston, MA 02215  
(617) 787-1214

## **Industrial Engineer**

Traditionally, industrial engineers have been responsible for designing floor layouts in manufacturing facilities and for setting work and production standards. Many of these tasks are still being done manually, but the advent of computers and the increased sensitivity of business to product quality and service have expanded the work of industrial engineers dramatically. These engineers now design production function specifications, automatic distribution systems, automatic identification systems, and computer simulation packages for such nontraditional industries as wholesale and retail trade and the service industries.

In manufacturing plants, the role of the industrial engineer has also expanded. Industrial engineers have become an integral part of the entire manufacturing process. They are not just efficiency experts who stand next to the assembly line and "crack the whip." They are much more involved in the operation of the entire plant. For instance, at one firm, industrial engineers are defining and redesigning the entire plant distribution process, including both product inputs and outputs. The plans now being formulated will determine the distribution system for at least the next five years. Because of this expanded role in the plant, industrial engineers must be more team-oriented and have more interpersonal skills than ever before.

Another reason for industrial engineers' greater involvement in the entire plant has been the decline in labor costs as a percentage of the total manufacturing costs of production. At one firm, for example, labor costs comprise only five percent of total manufacturing costs, and so the industrial engineers work on other issues such as inventory control of production and distribution.

Industrial engineers use a wide range of tools and equipment during a typical week. These include computer-aided design and manufacturing (CAD/CAM) systems and computers of all types, as well as traditional materials such as blueprints, stopwatches, and template sets.

In the past, industrial engineers worked in production; now they are in sales, marketing, warehousing, distribution, customer services, and administration. Their less structured work schedule exposes them to a wide range of environments, from noisy, dirty production floors to clean, quiet offices and design rooms.

## **Education, Training, and Hiring Requirements**

Some firms hire only experienced industrial engineers through help-wanted ads in the newspapers and job fairs. Firms that hire new entrants recruit them almost exclusively from four-year colleges and universities. A bachelor of science degree in industrial engineering (or perhaps industrial technology) is necessary to be hired at the entry level.

Most recruitment tends to be within Massachusetts simply because several major colleges and universities in the state have industrial engineering programs. Among the largest are Northeastern University, Boston University (manufacturing engineering), University of Massachusetts at Amherst, University of Lowell, Western New England College, and the Massachusetts Institute of Technology's Sloan School.

Traditionally and primarily, the main task of industrial engineers is to provide support to the manufacturing function within a firm. Nowadays the use of computers is an important part of that support. Industrial engineers are expected to manipulate computer systems as a routine part of their jobs. Consequently, a facility with all types of computers is a very desirable skill for newly hired industrial engineers. Other desirable traits include the flexibility to adapt to changing manufacturing conditions and an ability to work well as a member of a team.

Communication skills, both written and oral, are also very important for industrial engineers. Many employers complain that engineers lack those skills. This is a difficult situation to remedy because most industrial engineering programs are filled with required courses. For example, at Northeastern University, less than five percent of a typical curriculum is open to electives. It is therefore difficult for school authorities to incorporate additional requirements into an already tight curriculum.

A desirable credential is cooperative education experience. For many employers, co-op "creates a resume" for the entry level candidate, and co-op students are the preferred source of new hires.

Many new engineers choose to take the engineer-in-training (EIT) examination, which covers broad scientific and engineering topics. After four years' experience, the engineer may take the Professional Engineering Examination, which covers specific engineering disciplines. Job opportunities for new engineers are increased through membership in the International Institute of Engineering (IIE), the American Institute of Industrial Engineering (AIIE), and the American Society of Quality Engineering (ASQE).

Junior engineers usually work on specific projects performing minor tasks. As they prove themselves, they are gradually given more responsibility. There are two career paths, the "line side" and the "staff side." Those engineers on the line side usually become managers. In the past, they were paid better than engineers on the

staff side. In recent years, however, some firms have instituted "dual echelon" compensation systems. Comparable positions in each career ladder were identified and pay rates were adjusted to be equal.

Additional schooling helps engineers advance on the job. Staff engineers are encouraged to obtain a master's degree in industrial engineering; line engineers, a master's degree in business administration. In addition, professional societies and many firms that employ engineers offer courses. Upper level managers teach some of these courses, and so engineers who attend them are noticed.

### **Industries That Employ Industrial Engineers**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
357	Computer and Office Equipment	24.7
372	Aircraft and Parts	10.1
367	Electronic Components and Accessories	7.6
366	Communication Equipment	6.7
382	Measuring and Controlling Devices	3.9
383	Optical Instruments and Lenses	3.6
354	Metalworking Machinery	3.5
356	General Industrial Machinery	2.8
355	Special Industry Machinery	2.7
739	Miscellaneous Business Services	2.6

### **Occupational Earnings**

The starting pay for industrial engineers is about \$27,600 a year.

### **Employment Outlook**

Opportunities for industrial engineers will be good during the coming decade as industry moves to improve its efficiency and enhance its competitiveness. Industrial engineers will be needed to modernize production processes, introduce integrated manufacturing systems, expand the use of automation in complex business operations, and study the environmental conditions affecting worker productivity.

### **Related Occupations**

Standards Engineer

Factory Layout Engineer

Configuration Management Analyst



## **Institutions Providing Training in Massachusetts**

### *Four Year, (Bachelor's Degree):*

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2000

Western New England College  
1215 Wilbraham Road  
Springfield, MA 01119  
(413) 782-3111

Central New England College of  
Technology  
768 Main Street  
Worcester, MA 01608  
(508) 755-4313

Worcester Polytechnic Institute  
Worcester, MA 01609  
(508) 793-5000

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2000

### **Where to Write for More Information:**

Institute of Industrial Engineers, Inc.  
25 Technology Park/Atlanta  
Norcross, GA 30092

## **Insulation Worker**

Insulation workers prevent the loss of heat or refrigeration from buildings. Properly insulated homes and buildings greatly reduce energy consumption by preventing loss of cool air on warm days and hot air on cold days. Boilers and steam pipes are two examples of where insulation can reduce energy loss.

Insulation workers paste, wire, tape, staple, or spray insulation into place. When insulating pipes, workers measure and cut a tube of insulation to the required length, then slip it over the pipe. Insulation is secured by wrapping a wire band around it or by taping or tightly wrapping it with a covering of tar paper, cloth, or canvas and then sewing or stapling into place. Sometimes insulation workers weld sheet metal around insulated pipes to waterproof insulation.

Foam insulation is used on walls and other flat surfaces. Workers usually spray the foam through wire mesh because its rough texture provides a strong surface to which the foam can adhere. One of the fastest and most popular methods of insulation

is loose-fill insulation. A compressor forces shredded fiberglass or rock wool insulation through a hose. The insulation is then sprayed into an attic or forced in between the interior and exterior walls.

Another popular form of insulation used in new construction or in conjunction with major renovation work is fiberglass batts. Workers staple this padding to the exterior walls and ceiling before drywall, paneling, or plaster walls are put into place.

Insulation workers may use power saws, welding machines, and compressors in their daily work. They also are familiar with the use of common handtools like trowels, brushes, knives, and stapling guns.

Insulation work is often dusty and dirty. The work is not as strenuous, however, as many other construction trades. Allergies caused by insulation particles can affect eyes, skin, and the respiratory system. Insulation workers who deal with the removal of cancer-causing asbestos take extra precautions (like wearing masks and special clothing) to protect themselves from this hazardous material.

### **Education, Training, and Hiring Requirements**

Most insulation workers learn their trade through on-the-job training programs. For most entry-level jobs, insulation contractors prefer high school graduates who are in good physical condition and have a driver's license. High school coursework in blueprint reading, shop, math, sheet metal layout, and general construction provide a very helpful preparation for insulation work.

Skilled insulation workers may advance to supervisory positions or become shop superintendents or contract estimators. Many insulation workers are members of the International Association of Heat and Frost Insulators and Asbestos Workers.

### **Industries That Employ Insulation Workers**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
174	Masonry, Stonework, and Plastering	68.5
176	Roofing, Siding, and Sheet Metal Work	13.8
171	Plumbing, Heating, Air-Conditioning	6.6

Most insulation workers are employed by insulation or other construction contractors. Others work in shipbuilding and in other manufacturing industries, such as chemical and petroleum refining, that have extensive installations for power, heating, and cooling.

## **Occupational Earnings**

Insulation workers can earn between \$400 and \$500 per week.

## **Employment Outlook**

Employment of insulation workers is expected to grow at an average rate as the need to insulate boilers and pipes in new factories, power plants, and office and apartment buildings stimulates employment growth. Moreover, existing buildings that need extra insulation and the need to remove and replace asbestos insulation will add to employment requirements.

Unlike other construction occupations, insulation workers usually do not lose work time when weather conditions are poor. Most insulation is applied after the buildings are enclosed.

## **Related Occupations**

Carpenter

Carpet Layer

Drywall Installer

Flooring Layer

Roofer

Sheetmetal Worker

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Massasoit Community College  
The Technical Institute at Blue Hills  
100 Randolph Street  
Canton, MA 02021  
(617) 838-5800

Springfield Technical  
Community Community  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

### *Vocational Education Programs:*

See Appendix C

## **Where to Write for More Information:**

National Insulation Contractors'  
Association  
1025 Vermont Avenue, N.W.  
Suite 410  
Washington, D.C. 20005



## **Insurance Adjuster or Examiner**

Claims adjusters work in casualty, or accident, insurance. Sometimes called claims representatives, insurance adjusters investigate accidents reported by policy holders, evaluate the validity of their claims, determine coverage, and negotiate payment. Adjusters specialize in one of the fields within casualty insurance: worker's compensation, property (both residential and commercial), automobile, and product liability. In the course of their investigations, adjusters may interview several of the parties to a claim to gather relevant facts. Adjusters then document their decisions in writing and report their findings to the company, the claimants and the attorneys. At the heart of each claim is presumably some injury or loss which has been sustained by the client. In light of this, adjusters must be tactful, remain calm under pressure, and be able to communicate effectively in person and in writing.

Entrants to the field spend six months to a year as claims representative trainees, pursuing a combination of formal class work, self-study and on-the-job training under an experienced supervisor. At the end of the training period they become a claims representative and, after an additional one to two years, senior claims representatives. Successful claims representatives can advance further in either technical or managerial areas.

"Claims approver" is a related job title found in medical and life insurance companies. Claims approvers, who exercise less independent judgment in reviewing insurance claims, compare them to the terms of the policy and use established criteria to decide whether and for how much claims should be paid. Claims approvers review medical and dental bills for payment and, in some instances, write or call the doctors, dentists, hospitals, and policy holders involved in a claim to obtain information. These workers must be able to communicate effectively, interpret policies, and occasionally exercise independent judgment. Knowledge of medical terminology and experience in the use of computers is desirable. The job involves little specialized training and is often a port of entry for other jobs in insurance.

In 1984, over 2,700 insurance adjusters, examiners, and investigators were employed in Massachusetts. They work primarily in the main or branch offices of insurance companies.

### **Education, Training, and Hiring Requirements**

Claims representative trainees in casualty insurance generally enter the field with a bachelor's degree. Liberal arts graduates who have had coursework in insurance may be well suited for this occupation because they have training in the kinds of communication skills -- writing, explaining, negotiating -- that are required to be

effective on the job. The educational background required of claims adjusters in many areas of casualty insurance is similar to that required of underwriters. Automobile insurance differs, however, in that adjusters must be licensed by the state and auto body shop experience can substitute for the degree. Although many claims approvers in life and health insurance companies have college degrees, such degrees are not required and claims approvers may substitute one or two years' experience in a doctor's office or medical facility.

### **Industries That Employ Insurance Adjusters and Examiners**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
633	Fire, Marine, and Casualty Insurance	45.8
641	Insurance Agents, Brokers, & Services	17.8
631	Life Insurance	16.8
632	Medical Service and Health Insurance	15.6
901	Federal Government	3.1

### **Occupational Earnings**

Salaries for trainees generally start at around \$19,000 with a raise at the end of the training period. Because of the narrow focus of their field, automobile adjusters are compensated at a somewhat lower rate than those in other areas of casualty insurance. Starting salaries for claims approvers range from \$15,000 to \$16,000, depending on the company and its location.

### **Employment Outlook**

As for other areas within insurance, the outlook for adjusters and examiners is favorable. The occupation is expected to show moderate growth through 1995.

Employment of insurance adjusters and examiners is expected to grow faster than average due to increasing volume of insurance sales resulting in more insurance claims. Whereas insurance is sometimes sold to groups, eliminating the need for personnel, each claim must be individually handled. This fact is creating employment opportunities for adjusters and examiners.

### **Related Occupations**

General Claims Agent (transportation)  
Automobile Appraiser (insurance)  
Customer Service Manager  
(communications)

Claims Adjudicator  
(government)

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Bunker Hill Community College  
New Rutherford Avenue  
Charlestown, MA 02129  
(617) 241-8600

North Shore Community College  
3 Essex Street  
Beverly, MA 01915  
(508) 927-4850

Cape Cod Community College  
Route 132  
West Barnstable, MA 02668  
(508) 362-2131

## **Insurance Clerk**

Insurance companies provide financial protection against loss, damage, or injury for people, property, automobiles, and businesses. They employ large numbers of clerical employees in a variety of capacities. In fact, clerical work constitutes one of the largest employment categories in the industry. In life, medical, health, fire, marine, and casualty companies, clerks comprise between six and fourteen percent of the total workforce. Insurance clerks process new policies, maintain records of existing policies, effect and record changes in policies in accordance with customer requests, provide information to customers about the cost and terms of policies, process claims, and collect and enter data on computers.

### **Education, Training, and Hiring Requirements**

A high school diploma is considered adequate for most entry-level clerical jobs in insurance. Courses in bookkeeping, typing, business math, business English, and office machines are desirable; and good telephone skills are a valuable asset for job seekers.



## Industries That Employ Insurance Clerks

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
641	Insurance Agents, Brokers & Services	55.5
631	Life Insurance	23.6
633	Fire, Marine and Casualty Insurance	17.9
632	Medical Service and Health Insurance	2.2

## Occupational Earnings

At the entry level Insurance Claims Clerks start between \$220 and \$250 per week. Experienced workers earn up to \$350 per week.

## Employment Outlook

As insurance companies move into financial services, opportunities for clerical workers in insurance are expected to expand.

Little or no change is expected in the employment of insurance clerks due to the greater use of word processors, computers, and other office machines.

The insurance industry is less sensitive to cyclical swings in the economy than most industries and therefore the number of insurance clerks does not fluctuate greatly from year to year.

## Related Occupations

Policy Change Clerk

Data Review Technician

Insurance Check Clerk

## Institutions Providing Training in Massachusetts

Aquinas Junior College  
15 Walnut Park  
Newton, MA 02158  
(617) 244-8134

Newbury College  
129 Fisher Street  
Brookline, MA  
(617) 739-0510

Bristol Community College  
777 Elsbree Street  
Fall River, MA 02720  
(508) 678-2811

Newbury Junior College  
921 Boylston Street  
Boston, MA 02115  
(617) 262-9350

Bunker Hill Community College  
New Rutherford Avenue  
Charlestown, MA 02129  
(617) 241-8600

North Shore Community College  
3 Essex Street  
Beverly, MA 01915  
(508) 927-4850

Cape Cod Community College  
Route 132  
West Barnstable, MA 02668  
(508) 362-2131

Professional School of Insurance  
61 Traveler Lane  
Marshfield, MA 02050  
(617) 834-7743

Lasell Junior College  
1844 Commonwealth Avenue  
Newton, MA 02166  
(617) 243-2225

Springfield Technical Community  
College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

## **Insurance Underwriter**

Underwriters are the intermediary between the insurance sales agent and the company. They analyze insurance applications and, using information from several sources, select the risks the company will insure. Underwriters determine the acceptability of client applications, set the terms of policies, assign costs, decide deductible amounts and payment plans, and issue written reports to supervisors and sales representatives explaining the reasons behind their decisions. They provide technical assistance to sales staff, by explaining the nature of the options the company is able to offer the customer.

Underwriters specialize in the kind of insurance offered by their companies -- for example, life, health, property, or commercial. In commercial insurance firms, underwriters synthesize information about business clients gathered by several departments (such as loss prevention, auditing, claims and credit reporting) to determine the potential risks, financial position, and claims history associated with prospective customers. In life insurance firms, underwriters use medical and actuarial reports to determine eligibility, costs, and coverage. In the case of existing accounts, underwriters use information from cooperating departments to analyze client histories and set the terms for policy renewal.

There are a number of career opportunities open to insurance underwriters. Within life insurance companies, they can progress to pensions, which are more complex and finance-oriented than other kinds of insurance. Commercial insurance offers three specialities: business, motor transport, and, for senior underwriters,

national risk, which deals with business customers with premiums of over one million dollars a year. Beyond the entry level, experienced underwriters can enter management from two paths. They can be promoted to either a senior underwriter in a specialty area or a supervising underwriter in charge of a group of employees. Some leave underwriting for work in related areas like loss prevention.

Underwriters work primarily in offices, where they use calculators and computers to conduct their analysis. Once they learn the factors associated with certain kinds of losses, underwriters are required to exercise a great deal of independent judgment. They need strong math skills in order to do the required computations and the ability to communicate effectively orally and in writing with supervisors, sales representatives and clients. The job typically requires forty hours a week.

Over four thousand underwriters were employed in Massachusetts in 1984. Employment is concentrated in large insurance companies in or near metropolitan areas.

### **Education, Training, and Hiring Requirements**

Most underwriters enter the field with a bachelor's degree from a four-year college or university. While employers may prefer candidates with a business, mathematics, or economics degree, graduates from almost any major can enter the field as long as they have the necessary math and statistical ability. Large companies recruit graduating seniors through placement offices on college campuses throughout New England. Applicants are screened by the recruiter and selected candidates are invited for more in-depth interviews at the company. Some firms accept unsolicited resumes thorough the mail. Successful applicants demonstrate strong writing and interpersonal skills, a solid math background, and good judgment. The employers we spoke to emphasized grade point average over prior experience for this entry-level position.

Next to college recruiting, many companies use internal posting to fill underwriter openings. Occasionally firms hire non-college graduates as underwriter trainees. High school graduates may be hired as underwriting clerks and gain the qualifications necessary to advance to underwriter through a combination of evening courses and experience. Those considering the career should enjoy working with figures, be accurate and attentive to detail, have the ability to synthesize and evaluate information, and appreciate the investigative aspect of the work.

Professional underwriters need to continually update their skills. They are expected to pass two national examinations during their first three years on the job and to take advantage of related courses offered by colleges and professional associations.



Companies often pay the costs associated with advanced underwriting courses, and some offer salary increases to employees who demonstrate a professional commitment to the field.

### **Industries That Employ Insurance Underwriters**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
640	Insurance Agents, Brokers, Service	40.8
633	Fire, Marine, and Casualty Insurance	38.1
631	Life Insurance	11.3
635,7,9	Pension Fund Insurance	2.8
632	Accident, Health and Medical Service Plans	2.3

### **Occupational Earnings**

Salaries range from \$18,000 to \$21,000 with the liberal benefits usually afforded insurance industry employees.

### **Employment Outlook**

This occupation is expected to show moderate growth through 1995 as insurance sales expand to meet the demand in new markets, (for example, insurance for greater numbers of working women). Most will be replacement jobs as experienced underwriters move up within this and related fields. Liability for environmental damage, changes in tax laws and increased competition in the industry should positively affect the demand for underwriters.

Employment of underwriters is expected to rise faster than average as insurance sales continue to expand and insurance products become more complex. A number of factors underlie the expected growth in the volume and complexity of insurance and the resulting need for underwriters such as shifts in the age distribution of the population; growing demand for insurance coverage for working women; growing security consciousness; and competition among insurance companies and changes in regulations affecting investment profits.

### **Related Occupations** Plan Administrator

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Bunker Hill Community College  
New Rutherford Avenue  
Charlestown, MA 02129  
(617) 241-8600

North Shore Community College  
3 Essex Street  
Beverly, MA 01915  
(508) 927-4850

Cape Cod Community College  
Route 132  
West Barnstable, MA 02668  
(508) 362-2131

## **Labor Relations Specialist**

Workers in this occupation, employed in the personnel departments of firms, attempt to solve problems that arise between labor and management. The job requires great tact, skill in negotiation, and the ability to recognize problems and propose solutions. The environments that labor relations specialists work in, their job responsibilities, and their qualifications vary so greatly that, to illustrate the variety, the role of this specialist in two very different firms will be discussed here.

The first firm is a unionized production facility that manufactures durable goods. In this firm, the duties of the labor relations specialist are of three kinds--duties toward the union, management, and the plant's personnel. Union-related duties consist of processing grievances and negotiating with local union representatives. During grievance proceedings, the labor relations specialist, who acts as a representative of management, talks to all the parties involved and tries to smooth things out. The specialist documents the findings and then advises management of the proper handling of the case. The goal here is to resolve the situation without the filing of a grievance.

If, however, a grievance is filed, the specialist's supervisor works closely with the union representative to negotiate a solution. When a solution is found, the specialist notifies the plant's management, which usually approves the procedure suggested by the specialists. If a solution is not agreed on, the local union calls in a national union representative who negotiates with the general supervisor of the labor relations department.

As can be seen, negotiating with the union is an important part of this job.

With local union representatives, the specialist also negotiates the local union contract, a supplement to the national contract.

Besides advising management during grievance procedures, the labor relations specialist's other duties toward management include interpreting local and national labor agreements and monitoring their compliance. In an effort to forestall problems, the specialist informs management of developments that may affect operations of the plant. The specialist is also a member of the quality improvement teams in the various production departments.

In addition to fulfilling duties toward management and the union, the labor relations specialist performs many of the usual personnel tasks such as interviewing job candidates, conducting orientation and training programs, and developing disciplinary actions.

At this large manufacturing plant, a labor relations specialist must "know the system" -- that is, the specialist must be very familiar with the union contract and with the problems of workers on the production line. Labor laws and affirmative action laws are not important, because they are superseded by the union contract. The feeling is that, to know and understand the system, a person must first work in the system. That is why all seven of the specialists at this plant previously worked on the production line.

At another firm of non-union contractors, set up by a university and the federal government to conduct high-level defense research, eighty percent of the employees are engineers, and the job of labor relations specialist is quite different. A thorough knowledge of the labor and affirmative action laws is necessary. Long hours are the rule, with a typical working day lasting ten to eleven hours. This is not an entry level position. All three labor relations specialists at this firm had at least seven years of previous personnel experience, as well as an advanced graduate degree.

The labor relations specialist at this defense contractor has four immediate duties: to work out problems between employees and supervisors, conduct and monitor disciplinary action, conduct termination proceedings, and give exit interviews. The specialist also provides training programs for managers and updates policies and procedures.

Working out problems is fairly straightforward. The labor relations specialist, after receiving a complaint from either an employee or a supervisor, investigates by talking to the parties involved separately and in private. The specialist then sorts through the information to get to the real issues, weighs the options, and comes to a solution. Sometimes the solution may be as simple as explaining the parties' points of view to each other; sometimes the solution may entail mediating a compromise.



Conducting and monitoring disciplinary action is a large part of a labor relations specialist's job. The main concern is solving performance-related issues such as an employee's not performing at the expected level. Insufficient skills, substance abuse, personal problems, and physical or medical problems are a few of the reasons why a person may not be performing well. The specialist tries to discover the exact problem and develop a program to solve it.

One method is to assign the employee to a probationary project. The employee is given a project to complete, clear instructions, and a deadline. The person knows that this is a probationary project and that his or her ability is being tested. Failure to successfully complete the project on time can lead to a demotion.

Another problem in the workplace is substance abuse. This company has an excellent policy on this issue. The labor relations specialist develops a program which will allow the employee to keep his or her job. The program consists of thirty days at a treatment facility followed by Alcoholics Anonymous or psychiatric counseling or both. The specialist coordinates the program with the company, the treatment facility, counselors, the employee, and any others who need to be included. Failure to follow the program can result in termination.

Termination, however, is resorted to only when everything else has been exhausted. Company policy makes it very hard to fire someone. A long termination proceeding must be conducted by the labor relations specialist. Whenever an employee undergoes disciplinary action, a memo is written explaining what the action is, why it is necessary, and what precipitated it. The memo goes into the employee's file. To start termination proceedings, the specialist writes a summary of the file indicating why the employee should be fired and the sends both documents to the three senior officials of the company. The specialist may be asked to present the reasons why the employee should be fired. (Only the senior officials can fire an employee.)

If the senior officials decide on termination, the employee's manager notifies the employee in the presence of the specialist. The specialist then explains how the former employee obtains benefits, completes the sign-out process, and gives the exit interview. All employees are given an exit interview when they leave the firm.

The managerial training that labor relations specialists provide is of two types. When a person is hired as a manager or promoted to that position, the specialist provides training in recruitment, counseling, and disciplinary procedures, and affirmative action. For those who are already managers, the specialist conducts preventive labor relations training that covers how to give effective performance reviews and how to communicate clearly.

## **Education, Training, and Hiring Requirements**

As implied in these job descriptions, all labor relations specialists must be tactful and must have the ability to remain (or appear) unbiased in delicate situations. Oral and written communication skills are necessary. Problem-solving ability, which has two aspects -- the analytical ability to identify problems and the creative ability to suggest effective solutions -- is a prerequisite for this occupation. Lastly, the labor relations specialist must be able to leave the job at work. Otherwise it can be very draining emotionally.

At the large manufacturing plant discussed earlier, the right occupational skills and personality traits are considered more important for labor relations specialists than education. All the specialists, including their supervisors, were hired from the production flow. None had a college degree when hired. Besides problem-solving and communication skills, the labor relations specialist at this plant must possess leadership qualities; that is, the specialist must be able to step into a situation and take control and must be able to command respect from employees, supervisors, and union representatives.

Recruiting for labor relations specialists at the manufacturing plant is straightforward. When an opening exists, it is posted internally. Applicants are then screened by the supervisors from the labor relations department. The supervisors look for production line experience and an indication of writing ability (such as a college course).

Prescreened applicants are invited to an interview. The interviewer looks for three things: interest in the job, communication skills, and problem-solving ability. A person's oral communication skills show up naturally in the interview. To determine the applicant's interest in the position, the interviewer asks why the applicant applied and what he or she knows about the job. To determine the person's problem-solving ability, the interviewer gives an example of a problem and asks how the applicant would solve it.

In most cases, the supervisors have a good idea of whom they want in the position before it is posted. Over a period of time, they get to know everyone on the production line. During seminars, in training sessions, and on quality improvement teams, some employees display traits and skills that will make them good labor relations specialists. These are the people who usually get hired for the job.

At the defense contract firm, labor relations specialists must possess many of the same qualities as those at the large manufacturing plant -- communication skills, leadership ability, tactfulness, problem-solving skills. The educational requirements, however, are quite different. The defense contractor requires a bachelor's degree in business administration, psychology, or another behavioral science with practical

application, plus seven to ten years of related experience. An applicant with a master's degree in industrial labor relations, plus the required experience, would have an advantage. But the firm does not recruit for labor relations specialists because, since there are only three employees in that position, openings don't occur very often.

Many people enter the labor relations field through personnel departments, especially recruiting. This kind of experience gives employees an exposure to the laws regarding labor, affirmative action, and worker's compensation. It is essential that labor relations specialists have a thorough knowledge of these laws.

### **Industries That Employ Labor Relations Specialists**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
735, 9	All Other Business Services	6.6
806	Hospitals	4.8
602, 3	Commercial Stock and Mutual Savings Bank	4.7
820	Education, Public and Private	4.0
736	Personnel Supply Services	3.5
930	Local Government	3.3

### **Occupational Earnings**

Entry level workers in this field start at about \$20,000 per year. Very experienced workers can earn in excess of \$33,000.

### **Employment Outlook**

Employment in this occupation is expected to grow about as fast as average so that employers will be able to meet the training and employee relations needs of an expanding workforce. Growth is projected to be particularly rapid in management consulting and personnel supply firms as businesses increasingly contract with other firms to provide personnel services.

The job market is likely to remain competitive in view of the abundant supply of college graduates and experienced workers with suitable qualifications.

### **Related Occupations**

Occupational Health and Safety Worker  
Employment Counselor

Industrial Psychologist  
Labor Economist



## **Institutions Providing Training in Massachusetts**

Boston College  
Evening Division  
Chestnut Hill, MA 02167  
(617) 552-3900

Boston University  
Metropolitan College  
755 Commonwealth Avenue  
Boston, MA 02215  
(617) 353-6000

Emmanuel College  
Division of Continuing Education  
400 The Fenway  
Boston, MA 02115  
(617) 735-9918

Fisher Junior College  
Evening Division & Weekend College  
108 Beacon Street  
Boston, MA 02116  
(617) 536-4647

Lesley College  
29 Everett Street  
Cambridge, MA  
(617) 868-9600

Suffolk University  
School of Management  
8 Ashburton Place  
Boston, MA 02108  
(617) 573-8000

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2400

## **Licensed Practical Nurse (LPN)**

These nurses provide direct care to people who are physically or mentally ill. LPNs who work in hospitals provide bedside care to patients, usually working with physicians and registered nurses or RNs. LPNs may be responsible for a range of procedures -- administering medication, changing dressings, recording temperatures or blood pressure readings, helping to deliver babies, or assisting in an intensive care unit. LPNs perform similar tasks in doctor's offices and clinics and provide patient care in private homes as well. In addition to direct care, LPNs teach patients and their families about the treatment and care needed and can delegate duties to hospital attendants and aides. Some LPNs work as private duty nurses and thus have slightly greater flexibility in scheduling work hours.

At hospitals and nursing homes, LPNs employed full-time usually have a forty-hour work week, including weekend and holiday shifts. Like many other health care workers, LPNs work either day, evening, or night shifts, and wages vary according to

the desirability of the shift. The job is physically demanding, involving lifting patients and long periods of standing. Practical nursing has both the rewards and the stress that come from working with sick patients and their families.

Historically, LPNs have had limited opportunities for advancing within or outside of the occupation, although many broaden their job skills and take on new responsibilities through clinical experience or continuing education programs. Some return to school in order to become RNs.

LPNs have been directly affected by recent trends in the health care industry. Several hospitals in Massachusetts, under pressure to minimize labor costs and attract patients, responded initially by reducing the number of LPN positions on their nursing staffs. Some layoffs occurred. A recent shortage of RNs, however, has caused many hospitals to re-evaluate the need for LPN staff. The demand for LPNs in long-term care, particularly in nursing homes, is still strong, although jobs in that industry do not typically provide the wage levels or status associated with hospital positions.

Approximately 18,000 LPNs were employed in Massachusetts in 1984. Hospitals and nursing homes are the largest employers of LPNs, and a smaller number work for nurses' registries (contract or personnel service agencies) and doctor's offices. Health maintenance organizations and home health agencies do not typically hire many LPNs but may begin to hire more due to a shortage of RNs. LPNs also work in private industry, in offices, and in schools.

### **Education, Training, and Hiring Requirements**

LPNs in Massachusetts, as in all states, must complete an approved training program that includes classroom work and clinical training. Most LPN certificate/diploma programs in Massachusetts last at least ten months, and most are offered at vocational schools, community colleges, and hospitals. The relatively short time required and the low cost of LPN training make this occupation accessible to people without the resources to go into a four-year program. In order to practice, LPNs must also pass an examination to become licensed with the Board of Registration in Nursing in Massachusetts.

## Industries That Employ LPNs

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
806	Hospitals	52.6
805	Nursing and Personal Care Facilities	25.9
801	Offices & Clinics of Medical Doctors	4.7
821	Elementary and Secondary Schools	4.1
736	Personnel Supply Services	3.7
902	State Government	2.2
836	Residential Care	1.5
901	Federal Government	1.3
808	Home Health Care Services	1.1

## Occupational Earnings

Most LPNs earn between \$16,000 and \$21,000 per year. LPN wages are generally higher in hospitals than in nursing homes.

## Employment Outlook

The employment outlook for LPNs is expected to be fairly good over the next ten years. Job growth in this occupation is likely to take place primarily in nursing homes and personal care facilities, as well as in private duty nursing. Growing demand for home health care may also provide new opportunities for LPNs.

The outlook for LPNs in the hospital sector is not clear. Hospitals may gradually replace LPN positions with RNs, in part because of a growing emphasis on acute care and sophisticated medical technologies; or hospitals may adjust staffing patterns in order to utilize LPNs with valuable clinical experience. In the near term, because of a general shortage of nurses in Massachusetts, employment prospects will continue to be good for LPNs in the hospital sector.

A much faster than average growth is expected for LPNs due to the rising demand in nursing homes, personal care facilities, home health programs, and other long-term care settings. There will be excellent job prospects for new graduates and experienced nurses alike.

## Related Occupations

Emergency Medical Technician

Social Service Aide



## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Berkshire Community College  
West Street  
Pittsfield, MA 01201  
(413) 499-4660

Northern Essex Community College  
100 Elliott Street  
Haverhill, MA 01830  
(508) 374-0721

Essex Agricultural and Technical  
Institute/Collegiate Division  
Route 62  
Danvers, MA 01923  
(508) 774-0050

Quincy Junior College  
34 Coddington Street  
Quincy, MA 02169  
(617) 786-8799

Massachusetts Bay Community  
College  
50 Oakland Street  
Wellesley Hills, MA 02181  
(617) 237-1100

### *Vocational Education Programs:*

See Appendix C

### **Where to Write for More Information:**

Communications Department  
National League for Nursing  
10 Columbus Circle  
New York, NY 10019

Recruitment and Placement  
Service, Veterans Administration  
810 Vermont Avenue, N.W.  
Washington, D.C. 20420

National Association for  
Practical Nurse Education  
and Service, Inc.  
10801 Pear Tree Lane  
Suite 151  
St. Louis, MO 63074

American Hospital Association,  
Division of Nursing  
840 North Lake Shore Drive  
Chicago, IL 60611

National Federation of  
Licensed Practical Nurses, Inc.  
P.O. Box 11038  
Durham, N.C. 27703

American Health Care Association  
1200 15th Street, N.W.  
Washington, D.C. 20005

## **Lithographer or Photoengraver**

Lithographers and photoengravers perform a variety of pre-press activities -- from producing negatives of the material to be printed to making printing plates. Lithographers work in offset printing, and engravers are employed in gravure and letterpress printing. In small shops a single worker handles all the pre-press tasks; in large shops, workers specialize as camera or scanner operators, lithographic artists, strippers, or platemakers.

Using either photographic equipment or computerized laser scanners, camera and scanner operators create a negative image of the copy to be printed, using either photographic equipment or computerized laser scanners. To be reproducible, photographs must be broken down into images made up of thousands of tiny dots called halftones. In addition, color photographs must be broken down into their component color parts. Separate negatives are made of each basic color (usually four to six); when these images are printed one on top of the other, the printed result looks very much like the original photo. The camera and scanner operators who work with halftone and color separation equipment are responsible for producing and developing these high quality negatives. When electronic equipment is used, the camera or scanner can be programmed to make up for faults in the original photo.

Lithographic artists, also called dot etchers or retouchers, adjust and touch up the negatives by hand. This job is highly skilled, requiring very fine work. As electronic scanning equipment becomes more and more sophisticated, however, there will be less for lithographic artists to do, because scanner operators will be able to electronically adjust and perfect a negative while they are producing it.

Strippers cut and arrange separate negatives of photos and text into a perfect negative image of the page. Platemakers use this negative to create a printing plate. In highly automated printing plants, platemakers operate a machine which makes the plates. In other shops, platemakers coat the blank metal plate with photosensitive chemicals, then lay the negative on top of it and expose it to bright light. Finally, the platemakers apply more chemicals, which make the exposed areas pick up and retain ink.

Commercial printers employ over two-thirds of photoengravers and lithographers, including the more specialized pre-press workers such as strippers. These firms produce the highest quality printed products with the most extensive use of color. Many commercial printers serve highly specialized markets and thus require highly skilled and specialized personnel. Eighteen percent of these workers are employed in book printing and publishing, while most of the rest work for newspapers.

### **Education, Training, and Hiring Requirements**

Most lithographic and photoengraving workers learn their skills through either long-term on-the-job training or formal apprenticeships. Outside the workplace, technical institutes, four-year colleges, and community colleges offer two- and four-year programs in lithographic arts. Even for entry level jobs, employers prefer to hire those who have had a vocational or trade school education.

### **Industries That Employ Lithographers or Photoengravers**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
275	Commercial Printing	66.5
273	Books	24.6
271	Newspapers	4.1

### **Occupational Earnings**

Wages for these pre-press workers vary widely -- from \$7.00 for entry level workers to \$17.00 for those with substantial experience. In the Boston area, union hourly wages for color strippers and scanner operators are reported at about \$15.00 and \$17.00, respectively. In a recent sample of Massachusetts newspapers, camera operators earned between \$7.50 and \$10.00 an hour. Like other printing workers, lithographers and photoengravers often have to work under time pressure and sometimes work overtime.

### **Employment Outlook**

Job opportunities for lithographers and photoengravers are expected to be excellent through the mid-1990s. All of these occupations are now in demand. In particular, there is currently a shortage of strippers and scanner operators. Technological change, however, will have varying effects on occupations in this category. The demand for scanner operators is likely to increase rapidly, whereas growth in camera, stripping, and platemaking jobs may be offset somewhat by labor-saving laser and electronic pagination technology.

Employment of lithographic workers is expected to grow faster than average, but employment of photoengraving workers is expected to decline. These divergent trends reflect the fact that offset printing methods -- which involve lithography -- are replacing letterpress printing, which requires photoengraving skills.

Rapidly rising demand for printed material is the principal factor underlying projected growth in employment of lithographic workers. However, although the



demand for printed material will expand the printing industry and create more jobs for lithographic workers, employment growth will not keep pace with future increases in the output of printed materials, given the labor saving nature of new printing technologies.

Employment opportunities for inexperienced individuals should be best for those who have completed postsecondary programs in printing technology. This training helps them learn lithography and adapt more rapidly to new processes and techniques.

### **Related Occupations**

Engravers

Designers

### **Institutions Providing Training in Massachusetts**

#### *Two-Year (Associate's) Degree:*

Springfield Technical Community  
College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

### **Where to Write for Further Information:**

Graphic Communications International  
Union  
1900 L Street, N.W.  
Washington, D.C. 20036

### **Loan or Credit Clerk**

Loan and credit clerks work for banks, department stores, personal credit institutions (credit unions, finance companies), and insurance companies. These clerks help loan, credit card, and charge account applicants complete applications and verify credit histories, employment, and personal references. Working in the credit department, clerks spend much of the time calling employers and other references on the telephone and verifying credit limits based on standard company guidelines for applicant income and assets, credit experience, and employment.

The introduction of computers has changed the loan and credit clerk job in recent years. Computers provide instant access to credit bureau data bases which track

personal credit histories, thus removing most of the correspondence formerly involved between clerks and customers and allowing for immediate decisions on applications.

The work requires an aptitude for math, the ability to operate a calculator and computer terminal, effective communication skills, and some typing. Experienced clerks can move into higher job titles in credit such as collections or bill adjustment clerk. In retail stores the work is very fast paced, with overtime sometimes required during holiday and sale seasons.

### **Education, Training, and Hiring Requirements**

Employers tell us that prior work experience is preferred for this occupation. A positive attitude, punctuality, teamwork, initiative, and the ability to be assertive on the telephone are important assets for job seekers. Large employers frequently provide tuition assistance for workers who wish to pursue further education. The job is usually a port of entry for other jobs in the firm.

### **Industries That Employ Loan and Credit Clerks**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
602	Commercial Banks	38.3
603	Savings Institutions	24.8
614	Personal Credit Institutions	14.7
616	Mortgage Bankers and Brokers	11.6
612	Savings and Loan Associations	7.9

### **Occupational Earnings**

Earnings range from \$200 to \$250 a week for new hires to \$300 to \$325 for more experienced workers.

### **Employment Outlook**

Over 2,700 workers were employed in this capacity in 1984. The occupation is expected to grow at a modest rate through 1995 due to the continuing demand for consumer credit.

Employment of loan and credit clerks will have an above average growth due to the population expansion and more people borrowing on credit. This will create the need for more and more investigations into individuals' financial background.

## **Institutions Providing Training in Massachusetts**

American Institute of Banking  
50 Charles River Plaza  
Boston, MA 02114  
(617) 227-1774

Newbury Junior College  
921 Boylston Street  
Boston, MA 02115  
(617) 262-9350

Aquinas Junior College  
15 Walnut Park  
Newton, MA 02158  
(617) 969-4400

Springfield Technical Community  
College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

Cape Cod Community College  
Route 132  
West Barnstable, MA 02668  
(508) 362-2131

## **Machinist, or Tool and Die Setter**

Tool and die setters produce the instruments, gauges, dies, and fixtures that, when attached to the machines built and set up by machinists, cut, shape, shave, or stamp out parts for metal and plastic products. The specific products produced by machinists, tool setters, and die setters differ. All three use all types of machine tools, such as drill presses, lathes, grinders, milling machines, planes, shapers, and other metalworking machinery. They all work from blueprints, sketches, and written instructions. And they all must work to very high tolerances. The difference is in what they make.

While machinists build, set up, and repair drill presses, lathes, and grinders, tool setters build the tools that are attached to them. For example, a machinist may assemble and adjust a drill press and may reconstruct any broken parts of the press. A tool setter, on the other hand, may repair or custom make a drill bit for the press. And while machinists build power punches and stamping machines, die setters build the dies that go into them. (Dies are metal forms used to shape metal in stamping and forging operations.) Together, machinists and tool and die setters build the machines and tools that are used in virtually every manufacturing process.

A tool or die setter begins work after receiving a work order which contains a blueprint, a sketch, written instructions, or all three. The worker then takes a piece of metal and shapes it into the correct tool with a lathe, grinder, drill, or other metalworking machine. To make sure the tool meets the specifications, the worker



uses calipers, micrometers, and other measuring instruments. A tool and die setter may also heat-treat tools and instruments.

Tool and die setters sometimes produce only one type of tool or machine or perform a specialized function. Specialized tool setters may be called jig and fixture builders, gauge setters, bench tool makers, or tool repairers. Die setters who specialize are sometimes called form die setters, trim die setters, forge die makers, punch finishers, or die repairers.

All-around machinists set up and operate machine tools, fit and assemble parts, and make or repair metal parts. Machinists receive job orders containing blueprints and sketches and then select the tools and equipment needed. They are able to set up and run all the machines necessary to complete a piece of work. In setting up a job, they fasten a piece of metal stock in a holding device such as a vise. They adjust the speed and movement of the machine so that the completed workpiece will have the correct measurements. To make or repair a tool or part, they may set up, adjust, and run lathes, boring mills, screw machines, milling machines, and grinders.

The duties of machinists vary. For example, at smaller plants, machinists may set up and run machines, as well as construct new machines and repair old ones. Larger plants may employ specialized machinists who set up machines for others to run, machinists who build machine tools, and others who repair machines. These specialized machinists are referred to as layout workers, machine builders, experimental machinists, job setters, or maintenance machinists, depending on the exact nature of their duties.

Work areas are usually brightly lit and well ventilated. Although machine shops are sometimes noisy, dirty, and hot, precision tool and die setters work in very clean conditions. Workers usually spend the entire day standing, and heavy lifting may be a frequent occurrence, especially for machinists. Workers may be splashed with cutting and cooling fluids used by machines. A careless worker can easily get hurt in the workplace, but the risk of injury is low because safety standards are strictly enforced. Workers wear safety glasses, ear plugs, and other protective gear when working near high-speed machine tools.

### **Education, Training, and Hiring Requirements**

Going through an apprenticeship is the most common method of becoming a machinist, tool setter, or die setter. Offered in cooperation between employers and unions, an apprenticeship combines classroom instruction with on-the-job training to teach individuals every aspect of the trade. Apprenticeships for machinists and tool and die setters last about three or four years.

Less formal training is available for those who do not want to go through apprenticeships. A machinist's helper, for instance, receives on-the-job training without classroom instruction. But this method of training is becoming more strict, the training period is longer than an apprenticeship, and the helper usually does not receive as thorough training.

Employers prefer workers with a high school diploma or an equivalent certificate. Basic high school technical courses such as industrial arts, machine shop, woodworking, drafting, and blueprint reading are beneficial. Aspiring machinists are encouraged to take algebra, trigonometry, physics, and various geometry courses. Pre-apprenticeship training is also a big plus.

Machinists, tool setters, and die setters must have a mechanical aptitude; many employers require prospective employees to take an aptitude test. These workers must have a temperament suited for precision work requiring concentration and physical effort. They should not mind grease and dirt, must be able to work without supervision, and should like working with their hands. Eyesight, with or without glasses, should be good enough to read minute measurements on the instruments they use. Because technical changes are constantly being made, workers must be able and willing to learn the processes and operations of the newest machines.

Highly skilled machinists, tool setters, and die setters have several paths of advancement. Supervisors are appointed from among the most highly skilled. Some tool and die setters become designers or engineers. With additional schooling, machinists may become instrument makers, technicians, or tooling engineers. Many machinists and tool and die setters open up their own shops.

### **Industries That Employ Machinists and Tool and Die Setters**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
359	Industrial Machinery	12.6
354	Metalworking Machinery	9.1
367	Electronic Components and Accessories	8.5
307	Miscellaneous Plastics Products	8.3
372	Aircraft and Parts	4.8
342	Cutlery, Handtools, and Hardware	4.2
366	Communication Equipment	3.8
382	Measuring and Controlling Devices	3.5
376	Guided Missiles, Space Vehicles, Parts	3.2
355	Special Industry Machinery	3.0

## **Occupational Earnings**

Machinists and tool and die setters enter their trade earning between \$6.00 and \$8.50 per hour. The most experienced workers are paid an hourly wage of about \$11.00, with some earning as high as \$18.00 per hour. The typical rate for all machinists and tool and die setters ranges from \$8.25 to \$10.50.

## **Employment Outlook**

Employment of machinists, tool setters, and die setters is expected to grow more slowly than the average. As the economy grows, the demand for machined metal parts will increase. It is expected, however, that some of the demand will be met by imports. In addition, technological advances in production processes may further limit employment growth. Nevertheless, a significant number of job openings will arise as a result of the need to replace workers who transfer to other occupations or retire.

## **Related Occupations**

Mold Maker

Instrument Maker

Metalworking Machine Operator

Tool Programmer

Metal Cutter

Locksmith

Metal Patternmaker

Welder

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Springfield Technical Community College

One Armory Square

Springfield, MA 01105

(413) 781-7822

### *Vocational Education Programs:*

See Appendix C

## **Where to Write for More Information:**

National Machine Tool Builders

7901 Westpark Drive

McLean, VA 22102

The National Screw Machine

Products Association

6700 W. Snowville Road

Breckville, OH 44141



The National Tooling & Machinery  
Association  
9300 Livingston Road  
Ft. Washington, MD 20744

The Tool & Die Institute  
777 Busse Highway  
Park Ridge, IL 60068

## **Mechanical Engineer**

All phases of production, from the initial design and development of a product to customer support and technical assistance, are responsibilities of the mechanical engineer. Typically, the engineer designs a new product, writes specifications for it, estimates the cost, supervises its manufacture, helps the customer set it up, and then makes any necessary adjustments. Depending on the size of the firm, the engineer's job may be more specialized and may involve a specific machine or set of problems. The engineer works closely with the sales, marketing, and customer service departments because any design or engineering change in the product being manufactured will affect how it is marketed and sold.

About half a mechanical engineer's time is spent at a desk, where product design, cost estimating, and manufacturing problems are worked on. The other half of the time is spent either on the shop floor or with customers at vendor work sites. The work environments of mechanical engineers are therefore quite diverse. They work in nearly all the departments within a firm and at various customers' locations.

A mechanical engineer uses three major types of equipment: computer-aided design and manufacturing (CAD/CAM) systems, computer numerically-controlled equipment (CNC), and photography or photolithography equipment, which is used to adjust and edit design changes. When setting up a production line or adjusting a new product, the engineer also uses all sorts of production tools such as calculators, oscilloscopes, calipers, and light tables.

A common misconception about mechanical engineering is that new engineers will be working solely on "engines" or machines. Instead, engineers have to address all kinds of mechanical problems encountered in all manufactured products on the job. These problems may include, for example, thermal difficulties between product parts or in product materials. In addition, engineers often address questions in material science about the strength or flexibility of product components (how the product performs while in use).

## **Education, Training, and Hiring Requirements**

A bachelor's degree in mechanical engineering is required for entry-level mechanical engineers. They are usually recruited at four-year colleges and universities, though help-wanted ads, and increasingly, at job fairs.

Successful applicants must have strong oral and written communication skills in order to interact with a variety of people from manufacturing, marketing, sales, and technical support departments. Flexibility is another desirable trait because mechanical engineers must solve all sorts of technical problems while a new item is in production.

While in school, an applicant should have work experience in a professional or manufacturing environment during the summer break, on work-study, or on co-op. Laboratory courses in science are also useful. Some employers have found that a better balance between theory and hands-on involvement is needed in mechanical engineering courses.

There are no licensing requirements for mechanical engineers, but membership in a professional organization such as the Institute for Packaging Electronic Circuits (IPEC) is encouraged. IPEC members elect a board that writes industry specification; serving on that board is therefore considered very prestigious.

Opportunities for advancement vary among firms. In one firm that manufactures multilayer printed circuit boards, for example, an engineer may progress in one of three directions: production engineering, management, or advanced process engineering. An engineer who wishes to become a manager may benefit from joining the IPC mentioned earlier and from taking courses toward a master's degree in business administration. Similarly, an engineer who wishes to specialize in advanced process engineering may benefit from obtaining a master's degree in mechanical or process engineering. The factors that influence an engineer's progress the most, however, are technical ability and the ability to get along with other people.

Additional schooling, therefore, has a limited effect on an engineer's chances for promotion. Because the product line at this particular firm is quite specialized, the best way for an engineer to advance is to acquire as much knowledge specific to this firm as possible.

## Industries That Employ Mechanical Engineers

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
891	Engineering and Architectural Services	9.7
372	Aircraft and Parts	9.1
739	Miscellaneous Business Services	8.5
367	Electronic Components and Accessories	6.8
366	Communication Equipment	5.8
357	Computer and Office Equipment	5.8
354	Metalworking Machinery	4.0
355	Special Industry Machinery	3.2
901	Federal Government	2.7
342	Cutlery, Handtools and Hardware	2.7

## Occupational Earnings

Mechanical engineers usually start at about \$23,000 to \$24,000 a year.

## Employment Outlook

Employment for mechanical engineers is expected to increase faster than average as the demand for machinery and machine tools grows and industrial machinery and processes become increasingly complex. Employment opportunities should remain favorable through the year 2000.

## Institutions Providing Training in Massachusetts

### *Four-Year (Bachelor's) Degree:*

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2300

Tufts University  
Medford, MA 02155  
(617) 381-3170

Central New England College  
of Technology  
768 Main Street  
Worcester, MA 01610  
(508) 755-4314

University of Lowell  
One University Avenue  
Lowell, MA 01854  
(617) 452-5000



Harvard and Radcliffe Colleges  
Byerly Hall  
8 Garden Street  
Cambridge, MA 02138  
(617) 495-1551

Massachusetts Institute of  
Technology  
77 Massachusetts Avenue  
Cambridge, MA 02139  
(617) 253-4791

Massachusetts Maritime Academy  
P.O. Box D  
Buzzards Bay, MA 02532  
(508) 759-5761

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2200

Southeastern Massachusetts  
University  
Old Westport Road  
North Dartmouth, MA 02747  
(508) 999-8605

University of Massachusetts--  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222

Wentworth Institute of  
Technology  
550 Huntington Avenue  
Boston, MA 02115  
(617) 442-9010

Western New England College  
1215 Wilbraham Road  
Springfield, MA 01119  
(413) 782-3111

Worcester Polytechnic Institute  
Worcester, MA 01609  
(617) 793-5286

**Where to Write for More Information:**

The American Society of  
Mechanical Engineers  
345 E. 47th Street  
New York, NY 10017

## **Medical Assistant**

Medical assistants, sometimes called clinical practice assistants, provide support services in doctor's offices and clinics. They help physicians treat patients, and they perform clerical and administrative work. Some medical assistants specialize in either clinical or clerical duties; in small offices, these assistants usually do both kinds of work. Their responsibilities can include taking patients' pulse and blood pressure readings, helping the physician during examinations and procedures, sterilizing instruments, scheduling appointments, arranging for lab tests, and handling medical records and insurance forms. There were 1,720 medical assistants working in Massachusetts in 1984.

### **Education, Training, and Hiring Requirements**

Medical assistants do not have to be licensed. Some employers offer on-the-job training programs, usually lasting about two weeks. There are also formal training programs in high schools and junior colleges, which grant certificates or associate's degrees. Employers prefer medical assistants to have high school diplomas. If an applicant has health care experience, however, this requirement may be waived. Some medical assistants in the Boston area have bachelor's degrees but no other work experience, and are using the occupation as a way to enter the health care field.

Medical assistants must have patience and good communication skills. They must be able to put people at ease. Because their job is fast-paced, they must be able to do several things at the same time. Word processing and familiarity with computers are also useful. In clinic and hospital settings, medical assistants have to take direction from two sets of people -- the physicians with whom they work closely and an administrative supervisor with whom they may have less contact. Medical assistants can move into more responsible administrative jobs on the basis of experience and skills alone, however advancement into related clinical occupations requires further schooling. On a clinical career path, medical assistants may want to advance to a licensed practical nurse or lab technician position, both of which require at least an additional year of education.

## Industries That Employ Medical Assistants

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
801	Offices & Clinics of Medical Doctors	51.3
902	State Government	21.2
806	Hospitals	16.6
804	Offices of Other Health Practitioners	4.0
808	Home Health Care Services	3.3
903	Local Government	2.6

Jobs prospects for medical assistants are expected to be excellent over the next ten years. Currently, many Massachusetts health care employers, particularly in central city locations, are experiencing shortages of applicants for medical assistant positions. Because group physician practices, clinics, and health maintenance organizations are expected to grow and have a high demand for medical assistants, many job opportunities should continue to be available in these settings.

### Occupational Earnings

Depending on experience, average wages of medical assistants range from \$6.00 to \$8.50 an hour.

### Employment Outlook

Employment of medical assistants is expected to grow much faster than average due to the anticipated expansion of the health services industry.

Employment growth will be spurred by the increased medical needs of an aging population, growth in the number of practitioners, more diagnostic testing and the increased volume and complexity of paperwork.

Job prospects will be greatest for those with formal experience, however because the need will be so great, employers will train applicants with no background provided they exhibit the necessary personal traits.

### Related Occupations

Podiatric Assistant

Medical Record Technician



## **Institutions Providing Training in Massachusetts**

### ***Two-Year (Associate's) Degree:***

**Aquinas Junior College--Milton**  
303 Adams Street  
Milton, MA 02186  
(617) 696-3100

**Aquinas Junior College--Newton**  
15 Walnut Park  
Newton, MA 02158  
(617) 969-4400

**Bay Path Junior College**  
588 Longmeadow Street  
Longmeadow, MA 01106  
(413) 567-0621

**Becker Junior College--Leicester**  
3 Paxton Street  
Leicester, MA 01524  
(508) 892-8122

**Chamberlayne Junior College**  
128 Commonwealth Avenue  
Boston, MA 02116  
(617) 536-4500

**Dean Junior College**  
99 Main Street  
Franklin, MA 02038  
(508) 528-9100

**Endicott College**  
376 Hale Street  
Beverly, MA 01915  
(508) 927-0585

**Essex Agricultural and Technical  
Institute**  
Collegiate Division  
Route 62  
Danvers, MA 01923  
(617) 774-0050

**Fisher Junior College**  
118 Beacon Street  
Boston, MA 02116  
(617) 262-3240

**Lasell Junior College**  
1844 Commonwealth Avenue  
Newton, MA 02225  
(617) 243-2000

**Massasoit Community College**  
The Technical Institute at  
Blue Hills  
100 Randolph Street  
Canton, MA 02021  
(617) 838-5800

**Middlesex Community College**  
Springs Road  
Bedford, MA 01730  
(617) 275-8910

**Mount Ida College**  
777 Dedham Street  
Newton Centre, MA 02159  
(617) 969-7000

**Newbury Junior College**  
921 Boylston Street  
Boston, MA 02115  
(617) 262-9350

**Springfield Technical Community  
College**  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

## **Where to Write for More Information:**

The American Association of  
Medical Assistants  
20 North Wacker Drive  
Suite 1575  
Chicago, IL 60606

Accrediting Bureau of Health  
Education Schools  
Oak Manor Office  
29089 U.S. 20 West  
Elkhart, IN 46514

American Medical Technologists  
Registered Medical Assistants  
710 Higgins Road  
Park Ridge, IL 60068

Joint Commission of Allied  
Health Personnel in  
Ophthalmology  
1812 N. St. Paul Road  
St. Paul, MN 55109

## **Medical Records Technician**

Medical records technicians are responsible for maintaining and organizing patients' medical records. Using standard codes and classification systems, these technicians record symptoms, diagnoses, procedures, and medications. They also retrieve the data for doctors, insurance companies, hospital administrators, and public health offices. For research purposes, medical records technicians may need to retrieve and organize data in particular ways, sorted by occurrence of symptoms or diagnosis, for example. As medical records departments are generally automated, technicians spend a great deal of time working with computers, both entering and retrieving data.

In the medical records departments of large hospitals and health maintenance organizations (HMOs), there is a tremendous amount of clerical work such as transcribing, data entry, and filing, as well as the more technical medical records work. In these settings, certified medical records technicians may specialize in the technical work, such as translating physicians' notes into codes or maintaining tumor registries; or they may work in supervisory positions, coordinating the work of data entry clerks and release-of-information clerks who fill out forms for schools, camps, or insurance companies and obtain physicians' signatures.

## **Education, Training, and Hiring Requirements**

Most technicians hold an associate's degree from an accredited medical records program. It is possible, however, to start as a clerk in a medical records department and advance after several years to the position of technician through on-the-job training and study in a correspondence program. Technicians can advance to

administrative positions with more responsibility for planning and developing information systems and supervising other medical records staff.

Medical records technicians can become certified through passing an examination. Certification is not necessary to practice; however, many employers prefer it and some require it, especially for supervisory positions.

### **Industries That Employ Medical Records Technicians**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
806	Hospitals	67.1
805	Nursing and Personal Care Facilities	12.7
808	Home Health Care Services	7.6

### **Occupational Earnings**

There were about 1000 medical records technicians employed in Massachusetts in 1984, primarily in hospitals (60 percent) and nursing homes (30 percent). Certified medical records technicians earn between \$17,000 and \$22,000. Clerks who are responsible for releasing information earn between \$12,500 and \$17,000. Data entry clerks in medical records departments typically earn between \$11,500 and \$15,000.

### **Employment Outlook**

Job opportunities for medical records technicians are expected to be very good through the mid-1990s. New reimbursement systems and other pressures to control costs are making medical records departments a more and more important part of health care management. Thus the demand for medical records technicians is likely to exceed the supply of job candidates. Most job growth will occur in hospitals, although opportunities will also exist in nursing homes, HMOs, insurance companies, and clinics.

Employment of medical records technicians is expected to grow much faster than average because of the pivotal role of medical records in managing health care costs. Management's need for accurate clinical data for purposes of financial control is the overriding reason for anticipated job growth.

Most job openings will be in hospitals due to the greatly increased need by management for complete, accurate, and timely clinical data. However, the need for accurate and up-to-date medical records is not limited to hospitals. Health maintenance organizations, surgicenters, medical group practices, nursing homes, and home health agencies share the need for complete and timely data.



The outlook for experienced technicians is excellent. Graduates of accredited programs will also be in great demand because the number of those completing programs is expected to fall short of demand.

### **Related Occupations**

Information Clerks

Insurance Clerks

Medical Secretaries

Medical Transcriptionist

### **Institutions Providing Training in Massachusetts**

#### *Two-Year (Associate's) Degree:*

Endicott College  
376 Hale Street  
Beverly, MA 01915  
(508) 927-0585

Holyoke Community College  
303 Homestead Avenue  
Holyoke, MA 01040  
(413) 538-7000

Laboure' Junior College  
2120 Dorchester Avenue  
Boston, MA 02124  
(617) 296-8300

Massachusetts Bay Community  
College  
50 Oakland Street  
Wellesley Hills, MA 02181  
(617) 237-1100

Northern Essex Community  
College  
100 Elliot Street  
Haverhill, MA 01830  
(508) 374-0721

Springfield Technical Community  
College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

#### *Four-Year (Bachelor's) Degree:*

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2200

## **Where to Write for More Information:**

American Medical Record  
Association  
Suite 1850  
875 N. Michigan Avenue  
Chicago, IL 60611

## **Medical Laboratory Technician or Technologist**

Medical laboratory personnel perform tests on blood, tissue, and urine to diagnose illness. Duties of lab workers may include examining of blood and tissue under a microscope, testing body fluids, growing cultures of tissue or fluid to determine the presence of bacteria, and matching blood types for transfusions. Laboratory technologists, who often hold supervisory positions in a lab, have more education and experience and perform more complex tests and analyses than technicians do. (Medical laboratory technicians are sometimes called clinical laboratory technicians.) Another important laboratory job is that of phlebotomist -- the person who draws blood.

In large labs, and in hospitals that have several different labs, technologists and technicians tend to specialize in a particular field. Common areas of specialization include biochemistry (chemical analysis of body fluids), microbiology (the study of bacteria and other microorganisms), hematology (the study of blood cells), histology (the study of human tissue), cytotechnology (the study of cells), and blood bank technology (typing and matching blood for transfusions). Most lab technicians and technologists work 40 hours a week. In hospitals, they often are required to work evening and weekend shifts.

### **Education, Training, and Hiring Requirements**

Lab technicians and technologists do not have to be licensed to practice, but many boards and organizations certify technologists in different specialties. Certification, though voluntary, helps in career advancement. Most technologists have a bachelor's degree in one of the life sciences; those who do highly specialized research often possess a graduate degree. Technicians are usually required to have an associate's degree or to have graduated from some other technical training program. Phlebotomists are generally trained on the job.

Lab workers must be accurate, attentive to detail, and able to work under pressure. Technicians can advance to the position of technologist with additional

education or sometimes with experience alone. Technologists can move into supervisory positions or research work; some go to work for manufacturers of laboratory equipment.

### **Industries That Employ Medical Laboratory Technicians and Technologists**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
806	Hospitals	61.7
806	Medical and Dental Laboratories	23.7
801	Office of Physicians	8.9
808	Outpatient Care Facilities	3.4
809	Health and Allied Services	1.9

### **Occupational Earnings**

There were 8,400 lab technologists and technicians employed in Massachusetts in 1984, the majority of whom worked for hospitals. Technologists who are just out of school earn salaries ranging from \$18,000 to \$24,000. Experienced medical technologists, or those in supervisory positions, earn between \$21,000 and \$28,000. Technicians earn between \$16,500 and \$21,000. Phlebotomists' salaries are in the range of \$13,000 to \$17,500.

### **Employment Outlook**

Jobs for lab workers are expected to grow somewhat more slowly than other health occupations over the next ten years. The number of patient days in hospitals is decreasing, and pressure to contain costs is resulting in fewer lab tests. While positions will be available as present workers leave, labs are not expected to expand greatly in the near future.

Employment of medical laboratory technicians is expected to experience only average growth even though there will be an increased volume of testing due to advances in laboratory automation which will boost production.

Three fundamental reasons for expansion in this field are: the increase in disease and disability that will accompany rapid growth of the middle-aged and older population; the probability of new, more powerful diagnostic tests; and lastly, research laboratories that work to find the cause, treatment and cure for diseases.

Many job opportunities will be in hospitals, but new opportunities will arise in commercial laboratories, health maintenance organizations and doctor's offices.



**Related Occupations**

Medical Technologist

Microbiology Technologist

Chemistry Technologist

Cytotechnologist

Tissue Technologist

**Institutions Providing Training in Massachusetts***Four-Year (Bachelor's) Degree:*

American International College

1000 State Street

Springfield, MA 01109

(413) 737-7000

Regis College

235 Wellesley Street

Weston, MA 02193

(617) 893-1820

Anna Maria College

Sunset Lane

Paxton, MA 01612

(508) 757-4586

Salem State College

352 Lafayette Street

Salem, MA 01970

(508) 745-0556

Assumption College

500 Salisbury Street

Worcester, MA 01609

(617) 752-5615

Simmons College

300 The Fenway

Boston, MA 02115

(617) 738-2107

Elms College

291 Springfield Street

Chicopee, MA 01013

(413) 598-8351

Southeastern Massachusetts

University

Old Westport Road

North Dartmouth, MA 02747

(508) 999-8605

Emmanuel College

400 The Fenway

Boston, MA 02115

(617) 277-9340

Springfield College

263 Alden Street

Springfield, MA 01109

(413) 788-3136

Fitchburg State College

160 Pearl Street

Fitchburg, MA 01420

(508) 345-2151

Stonehill College

Washington Street

North Easton, MA 02356

(508) 238-1081

Framingham State College

120 State Street

Framingham, MA 01701

(508) 620-1220

Suffolk University

Beacon Hill

Boston, MA 02108

(617) 723-4700

Merrimack College  
North Andover, MA 01845  
(508) 683-7111

North Adams State College  
Church Street  
North Adams, MA 01247  
(413) 664-4511

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2200

University of Lowell  
One University Avenue  
Lowell, MA 01854  
(508) 452-5000

University of Massachusetts--  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222

University of Massachusetts--  
Boston  
Harbor Campus  
Boston, MA 02125  
(617) 929-7102

## **Nuclear Medical Technologist**

Nuclear medicine is a specialty within the field of radiologic technology, which has grown as advances in computer technology have made a broader range of radiologic treatments and diagnostic procedures possible. Nuclear medical technologists administer radiopharmaceuticals, or radioactive substances, to patients, then measure and record the gamma rays emitted by the radiopharmaceuticals from different organs and tissues in the body. These technologists prepare samples taken from patients and images of different parts of their bodies (viewed on a screen or film). The information is then used by physicians to diagnose conditions such as cancer, blood clots, stroke, or other metabolic problems. Technologists may also give radiopharmaceuticals in larger dosages in order to treat patients.

These tasks require nuclear medical technologists to work with special imaging equipment and to prepare and maintain detailed records of all radiopharmaceuticals used and of each patient treated. They must protect themselves, co-workers, and patients by following radiation safety procedures. Some technologists do research or handle administrative functions. In addition, they often have to provide nursing care to the patients undergoing diagnosis or treatment, many of whom are seriously ill. Technologists work with physicians to develop treatment plans but otherwise work independently. They work primarily in the radiology departments of hospitals and clinics. Jobs generally involve a forty-hour work week, with some evening, weekend, and on-call hours.

In Massachusetts, about 700 people were employed as nuclear medical technologists in 1984. Almost 90 percent of employment in this occupation is in hospitals.

### **Education, Training, and Hiring Requirements**

A number of formal training programs in nuclear medicine technology are offered at community, state, and private colleges in Massachusetts. The programs lead to either an associate's or bachelor's degree. A license is not required for this occupation in Massachusetts, but trained technologists who pass a written exam can receive professional credentials through the American Registry of Radiologic Technologists and the Nuclear Medicine Technology Certification Board.

### **Industries That Employ Nuclear Medical Technologists**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
806	Hospitals	100.0

### **Occupational Earnings**

Salaries range between \$20,000 and \$28,000, with slightly higher wages for technologists that are certified.

### **Employment Outlook**

Strong job growth is projected for this occupation -- approximately a 33 percent increase by the mid-1990s. The nuclear medicine field is likely to develop as equipment and diagnostic capabilities are improved, particularly because radio-pharmaceuticals are used for early detection of cancer. Shifts in hospital staffing patterns, however, will also affect this specialty occupation. Hospitals will continue to reduce the number of tests per patient in order to reduce costs. Some may also "cross-train" staff so that fewer jobs in each specialty area of radiologic technology will be available.

Average employment growth is expected for nuclear medicine technologists and conflicting forces will shape the job outlook. Employment growth is likely to be constrained by competition from less invasive imaging methods -- computed tomography (CT) and magnetic resonance imaging in particular. Developments in diagnostic imaging technology are occurring at a dramatic pace, and it is likely that some of the tests that emerge by the year 2000 will replace procedures currently



performed by nuclear medicine technologists. At the same time, advances in medical diagnostics could spur use of nuclear medicine procedures.

In the years ahead, job opportunities for nuclear medicine technologists in offices of physicians, medical laboratories and outpatient imaging centers are expected to expand substantially although hospitals will continue to be the major employer of these workers.

### **Related Occupations**

Radiologic Technician

X-Ray Technologist

### **Institutions Providing Training in Massachusetts**

#### *Two-Year (Associate's) Degree:*

Bunker Hill Community College  
New Rutherford Avenue  
Charlestown, MA 02129  
(617) 241-8600

Springfield Technical Community  
College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

Massachusetts College of  
Pharmacy and Allied Health  
Sciences  
179 Longwood Avenue  
Boston, MA 02115  
(617) 732-2800

#### *Four-Year (Bachelor's) Degree:*

Anna Maria College  
Sunset Lane  
Paxton, MA 01612  
(508) 757-4586

Salem State College  
352 Lafayette Street  
Salem, MA 01970  
(508) 745-0556

### **Where to Write for More Information:**

American Society of Radiologic  
Technologists  
1500 Central Avenue, S.E.  
Albuquerque, NM 87123

Vice President for Professional  
Education  
American Cancer Society  
90 Park Avenue  
New York, NY 10016

Society of Nuclear Medicine  
136 Madison Avenue  
New York, NY 10016

Division of Allied Health  
Education and Accreditation  
American Medical Association  
535 N. Dearborn Street  
Chicago, IL 60610

Society of Diagnostic Medical  
Sonographers  
10300 N. Central Expressway  
Building 1, Suite 276  
Dallas, TX 75231

## **Occupational Therapist**

The term "occupational therapy" is somewhat misleading -- it is only slightly related to occupation, or work. Occupational therapists help patients develop or regain their ability to engage in purposeful activity, such as dressing and grooming themselves, cooking and housecleaning, going to school and learning, interacting with others, and -- in some cases -- working. Patients in occupational therapy may be of any age and may have physical, emotional, or developmental disabilities or injuries.

Occupational therapists analyze the kinds of activities that their patients need to perform to resume or maintain a normal life and then plan therapy accordingly. Often therapists practice activities with a patient; sometimes therapists must figure out ways to modify activities so they are easier for disabled patients to master. Occupational therapists also devise physical aids such as braces and splints and help patients learn to use them. To do this kind of work, occupational therapists must have patience, ingenuity, and the ability to gain the trust and confidence of their patients.

Occupational therapists usually work as part of a team that can include a doctor, nurse, psychologist, and physical therapist. About 60 to 70 percent of most occupational therapists' days are spent in direct care with either individuals or groups; the remainder is spent in meetings, evaluations, and documentation. Most occupational therapists specialize in work with a particular kind of disability. A little more than half of all occupational therapists work with patients who have primarily physical disabilities, and the rest work with those who have psychological or developmental problems.

## **Education, Training, and Hiring Requirements**

Occupational therapists must be licensed to practice in Massachusetts. To obtain a license, applicants must graduate from an accredited program and pass an examination. Training to be an occupational therapist involves at least a bachelor's

degree. Bachelor's degree programs generally last five years, the last year being an affiliation or internship in a clinical setting. Entry into these programs is quite competitive, and candidates should have good grades in science and health courses. There are also a number of master's degree programs in occupational therapy. Occupational therapists interested in becoming specialists in particular areas or in entering administrative, research, or teaching positions often undertake graduate training.

### **Industries That Employ Occupational Therapists**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
806	Hospitals	58.5
809	Health and Allied Services	10.7
805	Nursing and Personal Care Facilities	9.0
808	Home Health Care Services	6.2

### **Occupational Earnings**

There were 880 occupational therapists employed in Massachusetts in 1984. Earnings for occupational therapists ranged between \$19,000 and \$25,000. Therapists who are very experienced, who have master's degrees, or who are in supervisory positions can earn up to \$35,000 or more. Most occupational therapists work in nursing homes or hospitals, especially psychiatric and rehabilitation hospitals. Schools, home health agencies, community mental health centers, adult day care, and residential care facilities are also settings where occupational therapists work.

### **Employment Outlook**

Job opportunities for occupational therapists are expected to be excellent through the mid-1990s, due to growing demand for mental health, rehabilitative, and elderly care. While hospitals will still be the largest employer of occupational therapists, many of the new jobs will be in other settings such as home care, nursing homes, rehabilitation centers, and adult day care programs.

Employment in this occupation is expected to increase much faster than average due to the anticipated demand in the areas of rehabilitation and long term care.

The number of people who need rehabilitative services will rise as advances in medical technology continue to save lives that would have been lost. Additionally, as the baby boom generation begins to move into middle age, a period of high risk of heart disease and stroke, demand for cardiac rehabilitation programs is expected to



increase markedly. Finally, substantial growth is projected for the population of 35 years of age and above, an age group that suffers a very high incidence of disabling conditions.

Excellent job opportunities are expected in hospitals, nursing homes, school systems, schools for handicapped children, community mental health centers, home health programs, and private practice. The demand is expected to outstrip the supply for occupational therapists.

### **Related Occupations**

Industrial Therapist

Occupational Therapy Aide or  
Assistant

### **Institutions Providing Training in Massachusetts**

#### *Two-Year (Associate's) Degree:*

Becker Junior College--Leicester  
3 Paxton Street  
Leicester, MA 01524  
(508) 892-8122

Quinsigamond Community College  
670 West Boylston Street  
Worcester, MA 01606  
(508) 853-2300

North Shore Community College  
3 Essex Street  
Beverly, MA 01915  
(508) 927-4850

#### *Four-Year (Bachelor's) Degree:*

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2300

Worcester State College  
486 Chandler Street  
Worcester, MA 01602  
(508) 793-8040

Tufts University  
Medford, MA 02155  
(617) 381-3170

### **Where to Write for More Information:**

American Occupational Therapy  
Association  
1383 Piccard Drive  
Rockville, MD 20850

## **Painter or Paperhanger**

Painters apply paint, varnish, and other finishes to buildings and other structures. Surface preparation is very important in producing a professional job. Old surfaces must be cleaned of any dirt, dust, grease, or loose paint. To do this, painters wash, scrape, wire brush, or sand the surface. For some more difficult surfaces, chemicals, electric scrapers, sandblasters, or blow torches may be needed to remove the old paint. Cracks and holes in plaster, synthetic materials, metal, concrete, stucco, and wood are filled in or patched. Both new and old surfaces may need to be covered with a coat of primer or sealer (an undercoat) before a final surface covering is applied.

Painters may use ready-mix paints or they may blend and mix colors and additives into a base paint to achieve the desired color and consistency. Knowledge of thinners, drying agents, and fire and mildew retardants and their use is important. Usually the primary coat is applied to the area first. This coat seals the surface and prevents succeeding coats from penetrating. The subsequent coats carry the color and provide resistance to wear and weather.

Three major tools are used to apply paints and coating: the spray gun, the roller, and the brush. The painter selects the proper tools depending on the particular job.

There is room for specialization within the painting trade. Some painters work in the area of corrosion prevention. They use paints and other materials to stop or prevent the effects of corrosive elements on metal surfaces. Other painters seek employment creating decorative touches such as marbleizing, glazing, and stippling.

Paperhangers cover walls and ceilings of rooms with decorative wall coverings made of fabric, vinyl, paper, or other materials. Paperhangers prepare the surface by cleaning it and removing old wallpaper. Frequently they must also repair cracks and patch holes with plaster to achieve a flat, uniform surface.

When the surface is prepared, paperhangers measure the area to be covered and cut the covering into strips. While cutting the strips, paperhangers check the covering for flaws and closely examine the pattern so that it will be matched when the strips are hung.

Following the instructions that come with the wallpaper, paperhangers apply paste or other adhesives and brush or roll the adhesive on the covering. When they place the cut strips on the wall or ceiling, they must make sure that the strips are hung straight with the edges carefully butted together to make tight, closed seams. Using broad knives and brushes, paperhangers smooth the strips to make them stick and to

remove air bubbles and wrinkles. The excess covering from the top and bottom is then trimmed with a razor.

Painters and paperhangers need strong arm muscles because a lot of their work is done overhead. Although workers in both occupations need to be aware of possible injuries from slips and falls, normal safety precautions will eliminate much of the danger. Painters working outdoors may find themselves losing time due to inclement weather. Painters and paperhangers also need to be able to work in high places without dizziness.

### **Education, Training, and Hiring Requirements**

The accepted method of training for painting and paperhanging is an apprenticeship through which the beginner receives on-the-job instruction in all aspects of the work under the guidance of skilled craftsmen.

### **Industries That Employ Painters and Paperhangers**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
172	Painting and Paper Hanging	41.0
903	Local Government	8.0
152	Residential Building Construction	5.9
806	Hospitals	5.7
653	Real Estate Agents and Managers	5.2
902	State Government	3.5
651	Real Estate Operators and Lessors	2.9
822	Colleges and Universities	2.5
446	Services Incidental to Water Transportation	2.4
821	Elementary and Secondary Schools	2.1

Painters and paperhangers may work for contractors engaged in new construction, repair, restoration, or modeling work. They may be employed in schools, hospitals, hotels, or office and apartment complexes as maintenance painters. A high proportion are self-employed as painting and wallpaper contractors.

### **Occupational Earnings**

Average pay for workers in this field is in the \$300 to \$350 per week range.



## **Employment Outlook**

Average growth is expected for painters and paperhangers as the level of new construction activity increases and the stock of structures that require maintenance and repair grows.

Since there are no strict training requirements for entry, many people with limited skills work for a short time and move on to other types of work creating many job openings. Because the number of paperhangers is relatively small, few openings will exist in this occupation.

## **Related Occupations**

Spray Painter

Metal Sprayer and Undercoater

Shipyard Painter

Transportation Equipment  
Painter

## **Institutions Providing Training in Massachusetts**

Greater New Bedford Technical  
1121 Ashley Boulevard  
New Bedford, MA 02745

Worcester Industrial Technical  
Institute  
26 Salisbury Street  
Worcester, MA 01608

## **Where to Write for More Information:**

International Brotherhood of  
Painters and Allied Trades  
1750 New York, Avenue, N.W.  
Washington, D.C. 20006

Associated Builders and  
Contractors  
729 15th Street, N.W.  
Washington, D.C. 20005

Painting and Decorating Contractors  
of America  
7223 Lee Highway  
Falls Church, VA 22046

## **Paralegal Personnel**

"Paralegals," "legal assistants," and "legal technicians" are all terms that refer to individuals who work under an attorney's supervision and are allowed to perform all of an attorney's functions except giving legal advice, presenting a case in court, setting legal fees, and accepting clients. Most advocates of the paralegal profession claim that paralegals improve the efficiency, economy, and availability of legal services.

Paralegals conduct background research to help a lawyer prepare litigation for trial. For example, a paralegal may investigate the key facts of a case to make sure that all relevant information is known. The paralegal may identify laws, judicial decisions, legal articles, and other material that will be used in determining whether a client has a good case. After analyzing all the information, the paralegal may prepare a written report to be used by the attorney in deciding how the case should be handled. If the attorney decides to take the case, then the paralegal may be responsible for preparing legal arguments, drafting pleadings to be filed with the court, obtaining affidavits, and actively assisting the attorney during the trial. Maintaining files of all documents and correspondence may be an additional task assumed by the paralegal.

Aside from litigation work, paralegals sometimes work in such areas as bankruptcy, criminal law, employee benefits, patent and copyright law, and real estate. Paralegals may prepare documents such as contracts, mortgages, separation agreements, and trust instruments. They sometimes help prepare tax returns and plan wills and estates. Some paralegals even coordinate the activities of law office employees and keep the financial records of the office; but many times that work is left to a legal secretary, someone with both administrative and clerical skills.

Within corporations, paralegals may assist lawyers with employee contracts, shareholder agreements, stock option plans, and employee benefit plans. Paralegals may also review government regulations to ensure that an organization is adhering to the law. Paralegal workers within government may collect and analyze evidence for hearings or prepare documents for the public that explain agency regulations and policy. Community legal services often need the services of paralegals to file forms, conduct research, and prepare documents.

In most legal offices, paralegals use computer software packages to search legal literature and locate legal texts.

### **Education, Training, and Hiring Requirements**

While some employers prefer to train paralegals themselves, more and more organizations are requiring formal legal assistant training. Most training programs last for two years and include courses in many areas of the law and legal research. Some programs provide specialized training in certain aspects of the law such as criminal law, family law, real estate, and income tax.

Legal assistants do not currently have to be certified; however, the National Association of Legal Assistants (NALA) has established certain standards for voluntary certification that require various combinations of education and experience. Annually, a two-day examination to become a Certified Legal Assistant (CLA) is given by NALA's Certifying Board of Legal Assistants.

## **Industries That Employ Paralegal Personnel**

<b><u>SIC</u></b>	<b><u>Industry</u></b>	<b><u>Percentage of Occupation</u></b>
811	Legal Services	83.6
902	State Government	7.9

## **Occupational Earnings**

In 1986, the average annual salary for paralegals was \$22,200. The average entry-level salary in Massachusetts service industries was \$15,819.

## **Employment Outlook**

The paralegal profession is expected to be the fastest-growing occupation over the next decade. Therefore, it is anticipated that significant increases in job openings for paralegal personnel will occur. The number of individuals competing for these positions, however, will also grow. Boston area college and university paralegal advisors already report a competitive market for entry-level jobs. Even so, job prospects are good for experienced paralegals.

## **Related Occupations**

Abstractor	Occupational Safety and
Claim Examiner	Health Worker
Compliance and Enforcement	Patent Agent
Inspector	Police Officer
	Title Examiner

## **Institutions Providing Training in Massachusetts**

### ***Two-Year (Associate's) Degree:***

Bay Path Junior College  
588 Longmeadow Street  
Longmeadow, MA 01106  
(413) 567-0621

Newbury Junior College  
921 Boylston Street  
Boston, MA 02115  
(617) 262-9350

Bay State Junior College  
122 Commonwealth Avenue  
Boston, MA 02116  
(617) 236-8000

North Shore Community College  
3 Essex Street  
Beverly, MA 01915  
(508) 927-4850



Becker Junior College--  
Worcester  
61 Sever Street  
Worcester, MA 01609  
(508) 791-9241

Endicott College  
376 Hale Street  
Beverly, MA 01915  
(508) 927-0585

Middlesex Community College  
Springs Road  
Bedford, MA 01730  
(617) 275-8910

Mount Ida College  
777 Dedham Street  
Newton Centre, MA 02159  
(617) 969-7000

*Four-Year (Bachelor's) Degree:*

Anna Maria College  
Sunset Lane  
Paxton, MA 01612  
(508) 757-4586

Northern Essex Community  
College  
100 Elliot Street  
Haverhill, MA 01830  
(508) 374-0721

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2200

Quincy Junior College  
34 Coddington Street  
Quincy, MA 02169  
(617) 786-8799

University of Massachusetts--  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222

**Where to Write for Further Information:**

Standing Committee on Legal  
Assistants  
American Bar Association  
750 North Lake Shore Drive  
Chicago, IL 60611

National Association of Legal  
Assistants, Inc.  
1420 South Utica  
Tulsa, OK 74104

National Federation of  
Paralegal Associations, Inc.  
P.O. Box 40158  
Overland Park, KS 66204

## **Personnel Specialist**

Personnel specialists are concerned with the identification and efficient use of employees within an organization. In recent years, businesses and organizations have come to realize the importance of people and skills to the success of any enterprise. Activities that focus on the employees who carry out the mission of the organization and their importance relative to other essential elements like financial capital and equipment have come to be known as human resources administration.

Human resources, or personnel, covers six broad areas: planning, performance evaluation, selection and staffing, training and development, productivity enhancement, and external factors. Planning deals with forecasting the number and types of workers who will be required to staff the enterprise. Performance evaluation involves describing and analyzing jobs and establishing performance standards, appraisal scales, and the procedures by which employees will be evaluated. Matching people with available jobs is the primary purpose behind selection and staffing. Training and development staff are concerned with improving job performance and enhancing the overall quality of the workforce. Salary and benefit administration, job enrichment programs, and job evaluation are functions required for maintaining and improving worker productivity. External factors include the legal and social issues that affect the workplace, such as equal employment opportunity, labor relations, and health and safety legislation and employee welfare programs such as counseling, medical services, and day care.

Within each of these areas are a number of occupational specialties, some of which require special academic preparation and professional training. In organizations where personnel functions are distinct and specialized, planning and research tend to be management-level activities. Positions in compensation and benefit administration, employee education and development, labor relations, equal opportunity, and health and safety generally require training or experience beyond the entry level. Opportunities for new hires occur most often in areas relating to performance evaluation, such as job analysis, or in selection and training functions like recruitment and employment interviewing. Jobs entitled "personnel generalist" or "assistant to" may also be appropriate for recent four-year graduates. Large companies can provide excellent training for new entrants, and a number offer management development programs which provide rotation through a number of personnel areas. In smaller firms where there are fewer staff, individuals may be responsible for more than one aspect of personnel administration.

Personnel administrators generally work in centralized offices. In large manufacturing firms or insurance companies, they are sometimes assigned to support

engineering or accounting groups. Professionals in this field spend as much time or more implementing policies and procedures, preparing reports, and completing forms as they spend directly assisting individual employees. Computers are essential tools in personnel offices for everything from tracking applicants and processing payroll to preparing statistical reports on the workforce.

### **Education, Training, and Hiring Requirements**

While some organizations provide training and promotional opportunities for clerical workers involved in personnel and payroll administration, most professional opportunities require a four-year degree. Management and psychology are two of the most popular majors for those planning to enter personnel. Education, counseling, and a number of liberal arts programs provide students with the communication, analytical, and problem-solving skills necessary for this field. Undergraduate courses in personnel management, organizational psychology, statistics, business computing, labor economics, and labor law are important. Internships, part-time work experience and some familiarity with personal computers are recommended for liberal arts majors. Beyond the entry level, a master's degree in counseling, education, or psychology is an appropriate credential for training, research, and employee assistance positions. Labor relations generally requires either union leadership experience or a master's degree in management or industrial relations. Many companies offer tuition reimbursement to allow generalists to take the advanced courses necessary for promotion into either management or one of the specialty areas.

### **Industries That Employ Personnel Specialists**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
357	Office & Computing Machinery	7.0
367	Electronic Components & Accessories	7.0
910	Federal Government	6.5
806	Hospitals	5.3
863	Labor Organizations	5.1
631	Life Insurance	4.2
602	Commercial Savings Banks	3.7
736	Personnel Supply Services	3.0

### **Occupational Earnings**

Entry-level salaries range from \$17,000 to \$25,000, depending upon education, experience, and the type of personnel work sought. Managers earn between \$35,000



and \$45,000, depending upon their area of expertise. Compensation and benefit administrators are among the highest paid human resource professionals. Personnel specialists employed by private search firms often work entirely on a commission basis.

Opportunities in personnel or human resources exist in private industry, government, and the non-profit sector, in almost any organization large enough to support a separate function to recruit, organize, and develop its workforce. Due to factors like company size and the cost associated with providing comprehensive personnel programs, organizations frequently hire outside consultants to help them identify, train, or classify their employees. Personnel consulting services, therefore, are also an important source of jobs in this field.

### **Employment Outlook**

In 1984 there were 6,790 personnel and labor relations specialists in the Commonwealth. The field is expected to grow by 17.8 percent through 1995.

Personnel specialist positions tend to be distributed evenly throughout industry and government. Large firms and organizations in industries which are growing or expanding will be the best sources of jobs in this field. In Massachusetts, opportunities are more plentiful among key industries, that is, in "high tech" firms, insurance companies and financial institutions, government agencies, health care facilities, and business service providers. The need for qualified personnel specialists is expected to increase in industries with labor shortages, like hospitality and retailing, where identifying and retaining qualified employees are essential activities. Training and employee education programs in business, already estimated to be a \$60 billion industry, are expected to become more important as firms assume a larger role in providing poor and minority workers with the basic educational and job readiness skills they need to compete in a service economy.

Average growth is expected for personnel specialists as employers try to meet the training and employment needs of an expanding labor force. Projected growth is especially strong in management consulting and personnel supply firms as businesses contract with outside firms to provide personnel services.

### **Related Occupations**

Certification and Selection Specialist  
Occupational Analyst

Industrial Relations Specialist

## **Physical Therapist**

Physical therapists and their assistants work with patients that have physical disabilities due either to injury or disease. These therapists develop and administer treatment to relieve pain or restore functioning and mobility for their patients and help prevent or limit permanent disabilities. Physical therapists often work with accident or stroke victims and physically disabled children, but they also help to treat people with diseases such as multiple sclerosis and conditions such as arthritis. Some therapists specialize in areas like pediatrics, geriatrics, sports medicine, or neurology.

The procedures that physical therapists use with their patients require a very thorough knowledge of human physiology and anatomy. Exercises are used to increase coordination and strength and to improve patients' range of motion. Therapists may provide massage or apply treatments of heat, cold, water, electricity, or ultrasound to relieve pain, activate paralyzed muscles, or generally improve muscle and skin condition. Physical therapists need to develop relationships of trust and confidence with their patients, and also with patient's families when therapy treatments must be continued at home. Recordkeeping, in order to track patient progress and plan ongoing treatment, is another important part of a physical therapist's job.

Physical therapists' assistants administer many of the same treatments, but under the direction of a therapist. Assistants are not responsible for planning treatments and evaluating patients' progress.

While many physical therapists work in settings such as hospitals or clinics, which have specially equipped physical therapy departments, they must also be able to work in patients' homes. The job involves moving equipment and helping patients to walk, turn, and stand, and thus it is physically demanding. Therapists, particularly those in private practice, have to schedule treatments at times that are convenient for their patients, and often work on evenings or weekends.

### **Education, Training, and Hiring Requirements**

A license is necessary to practice physical therapy in Massachusetts; trained therapists must pass an exam in order to become licensed. Education and training can be pursued through bachelor's degree programs in physical therapy, certificate programs (for those with bachelor's degrees in other fields), and master's degree programs. According to a recent survey by the Area Health Education Center, employers prefer physical therapists with a master's degree for supervisory positions, but a bachelor's degree is considered adequate for most staff therapist positions. Physical therapy assistants usually possess an associate's degree and must be licensed as well.



## Industries That Employ Physical Therapists

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
806	Hospitals	54.0
809	Home and Allied Services	18.8
804	Offices of Other Health Practitioners	8.3
805	Nursing and Personal Care Facilities	5.9
808	Home Health Care Services	4.6
801	Office and Clinics of Medical Doctors	3.1

Approximately 1,900 physical therapists and 400 assistants are employed in Massachusetts. The majority work in hospitals, primarily in acute care hospitals but also in rehabilitation and chronic care hospitals. Home health care agencies are the next largest employer of physical therapists in Massachusetts. About a third of the therapists employed in this state work in nursing homes, private offices, public schools, academic institutions, residential care facilities, and ambulatory care centers. In recent years, growth in employment has been strongest in private practices, home health care, and rehabilitation hospitals. Many therapists work on a contract or consultant basis.

### Occupational Earnings

Most physical therapists earn between \$19,000 and \$23,000 annually. Experienced ones can earn as much as \$28,000 per year. Physical therapy assistants earn between \$11,000 and \$16,000 per year.

### Employment Outlook

The outlook for physical therapists and their assistants is very good. Employment among therapists is projected to increase 40 percent by the mid-1990s. As the demand for services grows among people with physical disabilities, the number of physical therapist jobs will grow. For example, the number of elderly people aged 80 and older, who often face disabling conditions like arthritis or stroke, is growing rapidly. Services will also be needed for other age groups, for accident and disease victims who survive due to advances in medical technology, and for the growing number of exercise and sports enthusiasts.

Hospitals are expected to provide fewer new jobs for physical therapists than they have in the past, although they will remain a major employer. Therapists working in hospitals may see patients for a shorter period of intensive treatment and then refer them to therapists in other settings like nursing homes. Growth in the home health care field will also benefit physical therapists. It is possible that hospitals will respond



to cost-containment pressure by using a larger ratio of assistants to therapists; in that case, opportunities for assistants will grow even more rapidly.

Employment of physical therapists is expected to grow much faster than average in response to the rapidly growing need for rehabilitation and long-term care services. Advances in rehabilitation medicine and therapeutic techniques are likely to create additional demand.

Job prospects in physical therapy should continue to be excellent through the year 2000. New graduates are in great demand, and the number of people completing training programs is expected to fall short of that needed to fill job openings. Job opportunities will occur in hospitals, rehabilitation facilities, home health agencies, nursing homes, and private practice.

### **Related Occupations**

#### **Occupational Therapists**

### **Institutions Providing Training in Massachusetts**

#### *Two-Year (Associate's) Degree:*

Becker Junior College--Worcester  
61 Sever Street  
Worcester, MA 01609  
(508) 791-9241

Newbury Junior College  
921 Boylston Street  
Boston, MA 02115  
(617) 262-9350

Endicott College  
376 Hale Street  
Beverly, MA 01915  
(508) 927-0585

North Shore Community College  
3 Essex Street  
Beverly, MA 01915  
(508) 927-4850

Lasell Junior College  
1844 Commonwealth Avenue  
Newton, MA 02166  
(617) 243-2000

Springfield Technical Community  
College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

#### *Four-Year (Bachelor's) Degree:*

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2000

Simmons College  
300 The Fenway  
Boston, MA 02115  
(617) 738-2000

Gordon College  
255 Grapevine Road  
Wenham, MA 01984  
(508) 927-2300

Springfield College  
263 Alden Street  
Springfield, MA 01109  
(413) 788-3000

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2000

University of Lowell  
Dugan Hall  
Lowell, MA 01854  
(508) 452-5000

### **Where to Write for More Information:**

American Physical Therapy  
Association  
111 N. Fairfax Street  
Alexandria, VA 22314

## **Physician Assistant**

Physician assistants (PAs) are a relatively new occupation within the health care field. Sometimes called "physician associates," PAs are trained to provide primary care under the direction of physicians. The occupation was created during the 1960s when there was a shortage of physicians. PAs interview patients, take medical histories, give physical examinations, order tests, and sometimes make tentative diagnoses and prescribe treatments. Although they work under the direction of a supervising physician, PAs handle most of the tasks involved in routine patient care and medical treatment. An increasing number of PAs work in specialty areas, such as assisting physicians in surgery or pediatrics.

PAs work in hospitals and in other primary care settings, such as health maintenance organizations (HMOs), private practices, and neighborhood health centers. A forty-hour work week is typical for PAs in clinics, but jobs in physicians' offices often include night or early morning hours. PAs who work in hospitals are likely to work significantly more than forty hours per week, usually with evening, weekend, and on-call hours. Opportunities for PAs (primarily surgeon assistants) have increased in some hospitals in recent years as the number of surgical residency programs has been cut back.

Only about four hundred PAs are employed in Massachusetts, primarily in the eastern part of the state. About 30 percent of the PAs in Massachusetts work in hospital settings. In the Boston area, PAs are likely to be affiliated with one of the

teaching hospitals. Those outside of Boston typically work at HMOs, private practices, or neighborhood health centers.

### **Education, Training, and Hiring Requirements**

Northeastern University offers the only training program for PAs in Massachusetts. The Northeastern program involves two full years of course work and clinical training. Applicants are now required to have a bachelor's degree and, if accepted, may then work toward an additional bachelor's or a master's degree. Extensive hands-on health care experience and personal maturity are both prerequisites for most PA training programs. A master's degree often helps PAs who seek jobs in hospitals or other large institutions to get higher salaries. National certification (by the National Commission on Certification of Physician Assistants) is not required by law in Massachusetts, but many employers require it. Certified PAs are also required to take a formal re-certification test after they have worked for six years. In addition, one hundred hours of continuing education are required for every two years of practice as a PA. These must include formal training through conferences or hospital rounds, as well as less formal education gained through attending college courses or preparing articles or lectures.

### **Industries That Employ Physician Assistants**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
801	Offices & Clinics of Medical Doctors	44.1
806	Hospitals	20.5
802	Offices & Clinics of Dentists	19.4
805	Nursing and Personal Care Facilities	11.4

### **Occupational Earnings**

Entry level salaries are usually between \$20,000 and \$25,000; most PAs earn between \$25,000 and \$35,000 a year, although some who gain extensive experience or work with highly paid physicians may earn \$40,000 or more.

### **Employment Outlook**

The outlook for PAs in Massachusetts seems positive, although long term trends are difficult to predict. PAs are currently very small in number, but they may become increasingly attractive to hospitals that are seeking to combine quality of care with cost-effectiveness. Staff PAs offer similar advantages to HMOs. National Medicare



legislation passed last year, which allows reimbursement for services provided by PAs, may open up new job opportunities in private practices and more dispersed, community-based settings. However, the demand for PAs may also be affected, particularly in Massachusetts, by high medical school enrollments and an increasingly large supply of practicing physicians.

Employment of physician assistants is expected to grow much faster than average due to anticipated expansion of the health services industry and greater reliance on PAs to provide primary care and assist with complex medical and surgical procedures. Prospects for newly trained PAs are excellent since demand is expected to outstrip supply.

### **Related Occupations**

Nurse Practitioner

Occupational Therapist

Physical Therapist

### **Institutions Providing Training in Massachusetts**

#### *Four-Year (Bachelor's) Degree:*

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2200

### **Where to Write for More Information:**

Association of Physician  
Assistants  
1117 North 19th Street  
Suite 300  
Arlington, VA 22209

National Commission on  
Certification of Physician  
Assistants, Inc.  
3384 Peachtree Road, N.E.  
Suite 560  
Atlanta, GA 30326

### **Plumber or Pipefitter**

From the era of ancient Roman bath houses and aqueducts and continuing on through modern times, plumbers have constructed intricate systems of pipes to transport water and sewage. Every residential or commercial building has a maze of pipes within its structure. These systems can carry water, steam, air, sewage, and other liquids and gases.

Plumbers do four kinds of work. First, they lay pipes from street mains to buildings. They also put in sewage, venting, gas, and water systems in new buildings. Third, they install fixtures such as bathtubs, sinks, and heating and cooling systems. Finally, they repair or update pipes and fixtures. Some plumbers specialize in one or more of these jobs; others do all of this work.

Plumbers work with pipes of brass, copper, lead, steel, glass, plastic, tile, and concrete. To make systems, plumbers cut and bend the pipes and then weld, glue, cement, solder, or thread the joints or bond them with chemicals. Large pipes are cut to the correct size with hand cutters, power cutters, or torches. Plumbers put in joints such as elbows (two openings) or tees (three openings) and make them watertight, test the pressure, and locate any leaks. When it is impractical or impossible to dig trenches, plumbers may use a hydraulic jack to force pipes through the ground.

Plumbers need to be able to work from blueprints and determine planned locations of pipes, plumbing fixtures, and appliances. They must also know the most cost-effective ways of fitting piping into the structure of a building. When measuring and marking areas where pipe will be installed and connected, plumbers check for obstructions, such as electrical wiring, and plan how to install pipe around them.

Most communities have inspection codes for plumbing work and may require plumbers to pass a municipally administered written test on plumbing procedures. In addition, plumbers may be required to show that they can cut and bend pipe, make a tight joint, and bring pipe to the right size. They also need to show their skill in comprehending blueprints and properly installing systems. Each job that a plumber does must meet the safety and structural criteria set forth in these codes.

Plumbing requires a great deal of physical exertion. Plumbers need to be healthy and fit to be able to handle this demanding work. They may have to work outside or in cramped and dirty places and lift heavy materials as part of the job.

### **Education, Training, and Hiring Requirements**

Most plumbers are members of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the U.S. and Canada. The National Association of Plumbing-Heating-Cooling Contractors administers apprenticeships. Apprentices learn such basic skills as identifying grades and types of pipe, use of plumbing tools, and general safety rules.

Commercial and heavy construction firms prefer to hire union members. Home repair and remodeling work often goes to nonunion plumbers. In some municipalities, plumbers must pass a test indicating their knowledge of both building codes and plumbing regulations and receive a special license.

## **Industries That Employ Plumbers and Pipefitters**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
171	Plumbing, Heating, Air-Conditioning	58.4
891	Engineering and Architectural Services	3.8
822	Colleges and Universities	3.6
806	Hospitals	3.5
373	Ship and Boat Building and Repairing	3.3
903	Electrical Work	2.6
152	Residential Building Construction	1.9
492	Gas Production and Distribution	1.6
901	Federal Government	1.5
821	Elementary and Secondary Schools	1.4

### **Occupational Earnings**

Plumbers in the Boston area earn an average of \$15 to \$16 per hour.

### **Employment Outlook**

Employment of plumbers and pipefitters is expected to have an average growth rate in response to anticipated growth in residential, industrial, and commercial construction. Renovation and maintenance of powerplants, water treatment plants, pipelines, office buildings, factories and other projects that have large, complex pipe systems are also expected to spur demand for these workers.

Because of the relatively high wages and extensive training opportunities, competition for plumbing and pipefitting apprenticeships is expected to remain keen.

### **Related Occupations**

Boilermaker	Hot Air Furnace Installer
Electrician	and Repairer
Elevator Construction	Millwright
Environmental Control System	Oil Burner Servicer and
Installer and Servicer	Installer
	Sheet-Metal Worker



## **Institutions Providing Training in Massachusetts**

Franklin Institute of Boston  
41 Berkeley Street  
Boston, MA 02116  
(617) 423-4635

Cape Cod Plumbing School  
175 West Main Street  
Hyannis, MA 02601  
(508) 775-7688

Minuteman Vocational Technical  
School  
758 Marrett Road  
Lexington, MA 02173  
(617) 861-6500

Quincy Junior College  
34 Coddington Street  
Quincy, MA 02169  
(617) 984-1600

## **Where to Write for More Information**

National Association of Plumbing-  
Heating-Cooling Contractors  
180 South Washington Street  
Falls Church, VA 22046

Associated Builders and Contractors  
729 15th Street, N.W.  
Washington, D.C. 20005

National Fire Sprinkler Association  
P.O. Box 1000  
Patterson, NY 12563

Mechanical Contractors Association  
of America  
5410 Grosvenor Lane, Suite 120  
Bethesda, MD 20814

## **Preschool Teacher**

Preschool teachers provide care, supervision, and educational programming for very young children. Working in nursery schools, preschools, and day care centers, preschool teachers plan and implement activities to foster children's social, emotional, cognitive, and physical development. Depending upon the kind of school they work in, preschool teachers may be responsible for children as young as 2.9 years to about 5 years old. This age group places multiple demands on teachers, who must be as concerned with providing basic care, love, and individual attention for the children as they are with group instruction and recreational activities. The teachers prepare meals or snacks, supervise rest periods, plan daily schedules, confer with parents, design science projects, conduct field trips and nature walks, monitor playground activities, and develop games and other activities to introduce children to basic concepts like colors, numbers, and the alphabet. Music, games, and stories are used to teach important social skills like cooperation and respect for others.

Early childhood education is an intellectually, emotionally, and physically demanding field. Successful teaching requires a number of important skills. As care

givers, teachers need to be friendly and outgoing, as well as versatile -- to sing and play with children comfortably and make them feel at home. As child development specialists, teachers need the flexibility to adjust their approaches to the needs and personalities of individual children. As educators, teachers need to be inventive and imaginative -- to support and enhance children's natural curiosity and be willing to learn new things themselves. Finally, as "mandated reporters" (that is, professionals who have a legal responsibility to call attention to abuse or neglect) teachers have to carefully observe each child's health and behavior. Calling attention to potential trouble signs in a child's life requires assertiveness, conviction, and strong communication skills.

Positions in early childhood education range from aide to teacher, head teacher, and administrator. Hours differ according to the type of school. Nursery and preschool programs usually involve either morning or afternoon sessions, while day care centers operate full time. Like their colleagues in other teaching occupations, early childhood teachers spend most of their working hours with children. Most planning and preparation is done outside of school.

Preschools and day care centers are either funded by federal or state agencies or operated by private individuals. They may be located in separate facilities or in homes. In 1985, the Massachusetts School Improvement Act (Chapter 188) provided funds for the development of early childhood programs in the public schools.

### **Education, Training, and Hiring Requirements**

Licensing and regulation of preschools and day care centers in Massachusetts are handled by the state Office for Children. The agency sets the standards for all aspects of operation -- the number of children allowed per center, physical space requirements, equipment and supplies, and teacher qualifications.

Education and training requirements vary according to job title and the type of facility. Pre-requisites for aide, teacher, head teacher, and administrative positions include varying combinations of formal education, designated "core" courses in early childhood education, and related work experience. A complete listing of job titles and requirements is available from the Office for Children in Boston. All teachers must be at least 21 years old. At the present time, it is possible to find a job in Massachusetts as either an aide, teacher, or even head teacher with a high school diploma, provided that the other criteria are satisfied. However, efforts to upgrade the profession and promote linkages to the public schools are likely to raise the minimum credential to a bachelor's degree.

Teacher candidates need a thorough grounding in early childhood development theory, an awareness of social conditions, and a sensitivity to other cultures. Courses in

child psychology, cognitive development, basic nutrition, teaching methods, family and legal issues, creative arts, writing, and science provide a foundation for work as a preschool teacher.

### **Industries That Employ Preschool Teachers**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
835	Child Day Care Services	51.7
821	Elementary and Secondary Schools	36.5
839	Social Services	5.5
864	Civic and Social Associations	3.2
832	Individual and Family Services	2.5

### **Occupational Earnings**

At the present time, salaries for preschool and day care teachers are low. Many earn less than \$6.00 an hour and few receive benefits. Society's attitude toward the value and even the appropriateness of child care and the fees that working parents can afford to pay have traditionally kept wages low. However, government-sponsored programs like Head Start offer better incentives and the move into the public schools is expected to have a positive effect on salary levels. Growth in employer-sponsored day care may help upgrade conditions further.

### **Employment Outlook**

Due to the dramatic increase in the number of dual career families in Massachusetts and elsewhere, there is currently a great demand for high quality care for younger children. Women are far less likely to leave the workforce today for marriage and childrearing. As they become a more significant economic and political force, more attention will be paid to the issue of child care. Employers are gradually coming to realize that suitable day care arrangements which provide working parents with peace of mind are good for business. Many employers are opening centers on-site or offering pre-tax earnings deductions to offset child care expenses. As long as mothers and fathers continue to work and continue to have children, the demand for qualified preschool teachers is expected to grow. Because day care centers offer full day services, they are expected to expand more rapidly than nursery programs. The introduction of day care programs into the public schools will create new jobs in the public sector but may make it difficult for private, owner-operated centers to compete for qualified personnel.



Employment of preschool teachers is expected to have an average increase through the year 2000. Although there will be fewer preschoolers, a higher proportion will have working mothers. This anticipated growth in the number of preschool-age children with working mothers and the need to replace those who leave this large occupation each year will create a great number of job opportunities in this field.

#### **Related Occupations**

Kindergarten Teacher

Day Care Worker

Elementary School Teacher

#### **Institutions Providing Training in Massachusetts**

##### *Four-Year (Bachelor's) Degree:*

American International College  
1000 State Street  
Springfield, MA 01109  
(413) 737-7000

North Adams State College  
Church Street  
North Adams, MA 01247  
(413) 664-4511

Atlantic Union College  
South Lancaster, MA 01561  
(508) 365-4561

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2000

Boston College  
Lyons Hall 120  
Chestnut Hill, MA 02167  
(617) 552-3100

Pine Manor College  
400 Heath Street  
Chestnut Hill, MA 02167  
(617) 731-7000

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2000

Salem State College  
352 Lafayette Street  
Salem, MA 01970  
(508) 745-0556

Brandeis University  
415 South Street  
Waltham, MA 02254  
(617) 647-2878

Simmons College  
300 The Fenway  
Boston, MA 02115  
(617) 738-2000

Clark University  
950 Main Street  
Worcester, MA 01610  
(508) 793-7431

Springfield College  
263 Alden Street  
Springfield, MA 01109  
(413) 788-3000

Curry College  
Milton, MA 02186  
(617) 333-0500

Eastern Nazarene College  
23 East Elm Avenue  
Wollaston, MA 02170  
(617) 773-2373

Fitchburg State College  
160 Pearl Street  
Fitchburg, MA 01420  
(508) 345-2151

Framingham State College  
120 State Street  
Framingham, MA 01701  
(508) 620-1220

Gordon College  
255 Grapevine Road  
Wenham, MA 01984  
(508) 927-2300

Hampshire College  
Amherst, MA 01002  
(413) 549-4600

Lesley College  
29 Everett Street  
Cambridge, MA 02238  
(617) 868-9600

Mount Holyoke College  
South Hadley, MA 01075  
(413) 538-2023

Stonehill College  
Washington Street  
North Easton, MA 02356  
(508) 238-1081

Tufts University  
Medford, MA 02155  
(617) 381-3170

University of Massachusetts--  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222

University of Massachusetts--  
Boston  
Harbor Campus  
Boston, MA 02125  
(617) 929-7000

Westfield State College  
Western Avenue  
Westfield, MA 01085  
(413) 568-3311

Wheaton College  
Norton, MA 02766  
(508) 285-7722

Wheelock College  
200 The Riverway  
Boston, MA 02215  
(617) 734-5200

Worcester State College  
486 Chandler Street  
Worcester, MA 01602  
(508) 793-8000

## **Where to Write for More Information**

American Federation of Teachers  
555 New Jersey Avenue, N.W.  
Washington, D.C. 20001

National Council for Accreditation  
of Teacher Education  
1919 Pennsylvania Avenue, N.W.  
Suite 202  
Washington, D.C. 20006

## **Press Operator**

These workers set up and run printing presses. On traditional letterpresses, press operators pack the heavy lead plates onto the cylinder, a logistically difficult task. Offset presses are now more commonly used. These presses have much lighter flat metal plates that transfer the inked image to a "blanket" cylinder which is then rolled over paper, so that preparation of the press is less physically demanding.

Press operators are responsible for maintaining high printing quality -- adjusting the flow of ink to the page, monitoring the complex reproduction of color photos and graphics, ensuring that the paper is fed properly and that the pressure of the printing cylinder on the page is adequate. With high-speed web offset presses, this responsibility requires careful monitoring of many variables and adjusting controls quickly and accurately to avoid waste.

A growing number of commercial printers and newspapers use multicolor presses that require press operators to monitor the flow of ink for two, three, four, or even six different colors at one press. In the most highly automated press rooms, operators can control the operations of a number of presses via a central computer control panel. Press operators usually maintain, and occasionally repair, the presses.

Almost two-thirds of the industry's press operators are employed in commercial print shops, while most of the rest (16 percent) work for newspapers or in book printing and publishing (12 percent).

## **Education, Training, and Hiring Requirements**

Most press operators learn their skills on the job. In many cases -- particularly in the newspaper sector, which has traditionally been heavily unionized -- workers must complete a four-year apprenticeship in a press room. Commercial printing firms, which are mostly non-union, typically do not have apprenticeship programs. Commercial printers do, however, use a less formal, but equally lengthy, process to train press workers on the job. Commercial printers usually hire high school or vocational school graduates as press helpers. After approximately four years, these workers will have learned the skills necessary to become press operators.



Because newspapers and commercial printers usually have tight deadlines for completing jobs, press operators sometimes work under pressure. Evening and night shifts are very common, particularly for press operators who have less seniority.

### **Industries That Employ Press Operator**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
275	Commercial Printing	52.5
271	Newspapers	13.7
264	Miscellaneous Converted Paper Products	7.6
733	Mailing, Reproduction and Steno Services	4.0
265	Paperboard Containers and Boxes	3.1

### **Occupational Earnings**

Unionized press operators in the Boston area earn between \$12 and \$16 an hour. In other parts of the state and in non-union shops, wages are a little lower but are still generally above \$10 an hour. Operators who work on multicolor presses earn more than single-color press operators.

### **Employment Outlook**

Jobs for press operators are expected to increase by 13 percent over the next ten years. Although new technology has the potential for reducing the number of operators needed per press, growth in both newspaper and commercial print shops has thus far helped to offset any declines in manning levels that have occurred. Many firms plan to expand employment of press operators in the future.

Employment of press operators is expected to grow about as fast as the average for all occupations because of anticipated growth in the demand for printed materials.

Most new openings will result from industry expansion due to rising demand for printed material associated with demographic trends, U.S. expansion into foreign markets, and use of print media by advertisers. Changes in the age structure of the population are expected to spur demand for books and magazines as school enrollments changes. Substantial growth in the middle-aged and older population will spur adult education and leisure reading.

Major labor saving technological advances, similar to those now affecting the printing area, are not expected in the press area. Current efforts aimed at achieving higher press speeds and reduced set up time will likely produce labor-reducing effects that are more evolutionary than revolutionary in nature.

Apprenticeship training is likely to be required of individuals entering this occupation. They would face stiff competition from experienced workers and those who have completed training programs.

#### **Related Occupations**

Stripper  
Design Printer

Screen Printing Machine  
Operator

#### **Institutions Providing Training in Massachusetts**

##### *Two-Year (Associate's) Degree:*

Springfield Technical Community  
College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

#### **Where to Write for Further Information:**

Graphic Communications International  
Union  
1900 L Street, N.W.  
Washington, D.C. 20036

## **Psychologist**

Psychologists study human behavior and use their expertise to counsel and advise individuals and groups. Psychologists work in hospitals and clinics, schools, research facilities, colleges and universities, counseling and rehabilitation centers, and industrial settings. They administer psychological tests, evaluate clients, develop treatment plans, conduct individual and group therapy sessions, design and carry out research projects, and provide consultation on subjects related to psychology for professionals in other fields.

Among the best known specialties acquired by psychologists are clinical, school, counseling, and industrial psychology. Clinical psychologists diagnose the mental and emotional disorders of clients and administer appropriate treatment. Counseling psychologists deal more with adjustment issues than the treatment of disorders. They provide individual and group counseling services in universities, schools, and rehabilitation centers. School psychologists evaluate the needs, limitations, and

potential of young children. They test, work with, and design programs for both gifted children and those with emotional problems, frequently consulting with teachers, parents, and school planners. Industrial psychology is a relatively new field in which psychologists apply their understanding of human behavior to industry. Industrial psychologists deal with performance evaluation, productivity, and "ergonomics," or human factors research. Psychologists use testing, observation, one-to-one interviews, client histories and records, and consultations with other professionals in the treatment of individuals.

Hospitals, schools, and clinics employ nearly half of the 2,800 psychologists who work in Massachusetts. They work individually or in interdisciplinary teams composed of psychiatrists, nurses, social workers, and other mental health practitioners. Teams meet periodically around the needs of a particular patient. They assess the problem, develop a treatment plan, determine each team member's role in implementing the plan, and evaluate progress.

Psychologists have several career tracks. They may work for large institutions like hospitals or for small clinics in the community or may go into private practice. Additional study, publications, original research, keeping abreast of developments in the field, and consulting all enhance the psychologist's career.

### **Education, Training, and Hiring Requirements**

The term "psychologist" is typically reserved for individuals who are licensed. Licensing requires a doctorate, two years of experience supervised by a licensed psychologist, the endorsement of a licensed practitioner in the field, and the passage of an examination. While it is possible to work without a license, it is not advisable. Non-licensed individuals must work under the direct supervision of a licensed psychologist, have limited career mobility, and are ineligible for third party payments. Licensure carries with it more authority and prestige and therefore makes the individual a more competitive candidate for the limited number of available positions.



## Industries That Employ Psychologists

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
821	Elementary and Secondary Schools	26.2
806	Hospitals	15.5
902	State Government	12.8
832	Individual and Family Services	9.7
808	Outpatient Care Facilities	9.0
822	Colleges and Universities	6.7
801	Office of Physicians	5.4
901	Federal Government	5.4
839	Social Services	2.5
804	Offices of Other Health Practitioners	2.3

## Occupational Earnings

Annual earnings range from \$22,000 at the entry level to \$65,000 for experienced practitioners.

## Employment Outlook

Modest growth is expected for this occupation through 1995. The number of opportunities is predicted to expand by around 20 percent.

Employment of psychologists is expected to increase faster than average. Several factors will help maintain the demand for psychologists: increased emphasis on mental health maintenance in conjunction with the treatment of physical illness; public concern for the development of human resources, including the growing elderly population; and increased testing and counseling of children. However, changes in the level of government funding of these services could affect the demand for psychologists.

Persons holding doctorates from leading universities and those with extensive training in quantitative research methods and computer science will have a competitive edge. Bachelor's degree holders can expect very few opportunities in this field.

## Related Occupations

Psychiatrist

Social Worker

Clergy

Special Education Teacher

Counselor

## **Institutions Providing Training in Massachusetts**

### ***Four-Year (Bachelor's) Degree:***

American International College  
1000 State Street  
Springfield, MA 01109  
(413) 737-7000

Amherst College  
Amherst, MA 01002  
(413) 542-2000

Anna Maria College  
Sunset Lane  
Paxton, MA 01612  
(508) 757-4586

Assumption College  
500 Salisbury Street  
Worcester, MA 01609  
(508) 752-5615

Atlantic Union College  
South Lancaster, MA 01561  
(508) 365-4561

Boston College  
Lyons Hall 120  
Chestnut Hill, MA 02167  
(617) 552-3100

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2000

Bradford College  
32 South Main Street  
Bradford, MA 01830  
(508) 372-7161

Nichols College  
Dudley, MA 01570  
(508) 943-2055

North Adams State College  
Church Street  
North Adams, MA 01247  
(413) 664-4511

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2000

Pine Manor College  
400 Heath Street  
Chestnut Hill, MA 02167  
(617) 731-7000

Regis College  
235 Wellesley Street  
Weston, MA 02193  
(617) 893-1820

Salem State College  
352 Lafayette Street  
Salem, MA 01970  
(508) 745-0556

Simmons College  
300 The Fenway  
Boston, MA 02115  
(617) 738-2000

Smith College  
Northampton, MA 01063  
(413) 584-0515

Brandeis University  
415 South Street  
Waltham, MA 02254  
(617) 647-2000

Bridgewater State College  
Tillinghast Hall  
Bridgewater, MA 02324  
(508) 697-1237

Clark University  
950 Main Street  
Worcester, MA 01610  
(508) 793-7431

College of the Holy Cross  
College Street  
Worcester, MA 01610  
(508) 793-2443

Curry College  
Milton, MA 02186  
(617) 333-0500

Eastern Nazarene College  
23 East Elm Avenue  
Wollaston, MA 02170  
(617) 773-2373

Emmanuel College  
400 The Fenway  
Boston, MA 02115  
(617) 277-9340

Fitchburg State College  
160 Pearl Street  
Fitchburg, MA 01420  
(508) 345-2151

Framingham State College  
120 State Street  
Framingham, MA 01701  
(508) 620-1220

Southeastern Massachusetts  
University  
Old Westport Road  
North Dartmouth, MA 02747  
(508) 999-8605

Springfield College  
263 Alden Street  
Springfield, MA 01109  
(413) 788-3136

Stonehill College  
Washington Street  
North Easton, MA 02356  
(508) 238-1081

Suffolk University  
Beacon Hill  
Boston, MA 02108  
(617) 723-4700

Tufts University  
Medford, MA 02155  
(617) 381-3170

University of Lowell  
Dugan Hall  
Lowell, MA 01854  
(508) 452-5000

University of Massachusetts--  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222

University of Massachusetts--  
Boston  
Harbor Campus  
Boston, MA 02125  
(617) 929-7000

Wellesley College  
Wellesley, MA 02181  
(617) 235-0320



Gordon College  
255 Grapevine Road  
Wenham, MA 01984  
(508) 927-2300

Hampshire College  
Amherst, MA 01002  
(413) 549-4600

Harvard and Radcliffe Colleges  
Byerly Hall  
8 Garden Street  
Cambridge, MA 02138  
(617) 495-8601

Massachusetts Institute of  
Technology  
77 Massachusetts Avenue  
Cambridge, MA 02139  
(617) 253-4791

Merrimack College  
North Andover, MA 01845  
(508) 683-7111

Western New England College  
1215 Wilbraham Road  
Springfield, MA 01119  
(413) 782-3111

Westfield State College  
Western Avenue  
Westfield, MA 01085  
(413) 568-3311

Wheaton College  
Norton, MA 02766  
(508) 285-7722

Williams College  
P.O. Box 487  
Williamstown, MA  
(413) 597-2211

Worcester State College  
486 Chandler Street  
Worcester, MA 01602  
(508) 793-8000

#### **Where to Write for More Information:**

American Psychological  
Association  
Educational Affairs Office  
1200 17th Street, N.W.  
Washington, D.C. 20036

National Association of  
School Psychologists  
10 Overland Drive  
Stratford, CT 06497

The American Association of  
State Psychology Boards  
P.O. Box 4389  
Montgomery, AL 36103

National Health Council  
70 West 40th Street  
New York, NY 10018

## **Public Relations Specialist**

Getting one's message across is a critical element of success in today's crowded marketplace. The evening news reviews an art exhibit opening. A cat food company representative is interviewed about its pampered resident feline "taste testers." A movie star visits a talk show to discuss her new film. A conservation group holds a press conference at a dumpsite before a public vote on toxic waste cleanup. In order to influence the public to respond favorably -- for example, to support a museum, attend a movie, favor one brand of cat food over another, or vote for a particular issue -- organizations hire public relations specialists. These specialists work for business, health care, higher education, government, and social services, where they communicate organizational goals and policies to a variety of constituents and help project a positive public image. Arts, retail, and sports organizations and the hospitality, recreation, and entertainment industries are also major consumers of public relations services.

Public relations work is done either in-house, by a staff of writers, editors, artists, technicians, and spokespersons, or under contract with an outside independent agency. Corporate public relations has two functions: communicating information about the company internally to employees; and establishing a positive relationship with consumers, stockholders, government officials, and the public. Large, sophisticated employers may support separate offices for each function or combine the two under one heading.

Independent agencies perform many of the same services for their clients as in-house staff do for their employers, but on a fee-for-service or retainer basis. Their clients may be political candidates, professionals, charitable organizations, or small companies which do not have a public relations staff of their own. Large organizations occasionally hire outside consulting firms to work on special projects, sometimes in conjunction with in-house staff.

The number and range of job titles and the way institutional public relations departments are structured vary from place to place. Depending upon the size of the enterprise, positions may be highly specialized or more general in nature. A major corporation or a university, for example, may support a public affairs office, a news bureau, one or more magazines, a media production group, one or more lobbyists, a community service office, and an alumni or stockholder affairs department, each with its own staff and all reporting to a central vice president or director of communications.

Positions with independent agencies are easier to classify. Like advertising agencies, public relations firms generally employ junior account executives, account executives, and managers who create, plan, and implement activities on behalf of their

clients. Private agencies tend to specialize in one or two areas – for example, press relations or investor communications.

No matter where public relations specialists work, they use various communications media to attract attention to the positive things their clients do. They generate press releases, speeches, magazine articles, and annual reports. They write promotional copy and explanatory material like new product announcements, recruitment literature, and technical guides. They arrange press conferences, produce slide shows and training films, and plan special events such as branch openings. They are sometimes called on to handle customer complaints or conduct market research and often serve in a community relations capacity, by raising money for charity, dispensing grants, or administering scholarship funds.

The major difference between advertising and public relations is that advertising representatives *purchase* air time and print space for their clients while public relations specialists generate *free* publicity. The distinction between the two occupations sometimes blurs, especially when public relations specialists create tools like brochures or films to enhance a client's image.

The occupation requires not only strong writing and speaking abilities and creativity, but also good taste, diplomacy, and stamina. Public relations specialists frequently work long hours, especially during a crisis or a political campaign or in conjunction with a community event sponsored by their organization. Agency work is often stressful because of the pressure to attract and retain new clients.

### **Education, Training, and Hiring Requirements**

A bachelor's degree in English, journalism, communications, or a related field is usually required at the entry level. More important than the specific degree, however, are previous writing, broadcasting, or internship experiences. In this industry it may take as long as three years and one or more job changes to secure the right job. Carefully choosing a setting that is compatible with one's philosophy and temperament is as important as getting a job offer. Effectively representing an institution from the inside requires a degree of belief in its product or service and approval of its philosophy and methods. Agency work requires tenacity and the ability to cope with competition both inside the agency and in the marketplace.

While hospitals, manufacturers, universities, foundations, and other large institutional employers of public relations professionals sometimes recruit through the newspapers, they tend either to promote from within or to hire staff away from smaller employers in order to fill vacancies at the entry level. The independent agencies hire former interns, recruit from other agencies, and occasionally solicit referrals from well-known journalism departments at colleges and universities. Because recruitment tends



to be passive, candidates who aggressively seek out opportunities to show their work samples to prospective employers get more interviews and fare better than those who wait for ads in the newspaper.

### **Industries That Employ Public Relations Specialists**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
731	Advertising	12.0
861	Business Associations	6.5
833	Job Training and Related Services	6.4
806	Hospitals	6.3
862	Professional Organizations	4.7
483	Radio and Television Broadcasting	4.3
631	Life Insurance	3.8
864	Civic and Social Associations	3.8

### **Occupational Earnings**

Salaries in public relations vary widely. Institutional employers tend to offer better starting wages than agencies, who can often find interns or others willing to work for free just for the experience. New hires may earn between \$14,000 and \$18,000 in large cities. Account managers in consulting firms and experienced corporate staff may earn \$30,000 or more, depending upon the setting. Public relations specialists report that competition for entry-level jobs is fierce and the turnover is high.

### **Employment Outlook**

Rapid overall growth and prosperity in the service sector -- in banking, finance, and insurance, for example -- have caused an increase in the number of outside services businesses buy from other businesses. This increase has been and continues to be good news for independent agencies. Opportunities within large organizations depend on the economic well-being of those organizations and on events which take place in the environment. An example is deregulation of the banking industry. As banks move into new product lines and services, they will need to change the public's image of banking.

Some institutions which once relied solely on agencies are considering the benefits of hiring in-house staff. During a time of intense competition in the marketplace, in-house staff can cost less, understand the industry better, and produce faster than outside consultants.

Employment of public relations workers is expected to increase much faster than average due to a growth in demand for these workers from corporations, associations, health facilities, and other large organizations. The trend toward the use of public relations specialists by smaller organizations and professional groups should also stimulate employment growth.

Opportunities should be good for applicants with sound academic preparation and some media experience. Competition is expected to remain keen for persons without the appropriate educational background or for those not having the relevant work experience.

### **Related Occupations**

Sales/Service Promoter

### **Institutions Providing Training in Massachusetts**

#### *Four-Year (Bachelor's) Degree:*

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2000

North Adams State College  
Church Street  
North Adams, MA 01247  
(413) 664-4511

Emerson College  
148 Beacon Street  
Boston, MA 02116  
(617) 578-8600

#### **Where to Write for More Information:**

Career Information, Public  
Relations Society of  
America, Inc.  
845 Third Avenue  
New York, NY 10022

Service Department,  
Public Relations News  
127 East 80th Street  
New York, NY 10021

Public Relations Report,  
Dudley House  
P.O. Box 600  
Exeter, NH 03833

## **Purchasing Agent**

In large organizations such as manufacturing firms, hospitals, colleges, universities, and government agencies, the task of purchasing the goods, equipment, and raw materials that an organization needs rests with the central purchasing department. Organizations buy office supplies, furniture, paper products, business machines, test tubes, and other materials with the help of purchasing agents.

In manufacturing firms, the purchasing department buys products used in the production of final goods. Sometimes these purchases involve contracting with outside suppliers for parts or finished components which are then sold under the company name.

Purchasing agents work closely with sales personnel representing vendors to secure quality products at the best price. They review requisitions from internal departments, solicit and process bid proposals, and maintain records concerning product life and reliability. In most large organizations, purchasing agents use computers to monitor the types of goods needed, competitive suppliers, ordering and shipping dates, and quality.

At the entry level, the position is often referred to as "purchasing administrator." Purchasing administrators call vendors, assist internal departments with inquiries, and fill shortages by contacting existing contractors. On the job, purchasing administrators learn about contracts, negotiating, sales, and goods; and they acquire the skills necessary for promotion to buyer, senior buyer, subcontract administrator, and purchasing supervisor.

### **Education, Training, and Hiring Requirements**

A background in business or a related field is generally required for entry into this occupation. Although it is possible to obtain an entry-level job with two years of college or less, a bachelor's degree is increasingly required for advancement. Organizational ability, verbal skills, assertiveness, tact, and administrative skills are important qualities for candidates to possess. Much of the training is provided on the job, and a number of firms offer tuition reimbursement for courses that will enhance an employee's effectiveness in purchasing.



## Industries That Employ Purchasing Agents

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
367	Electronic Components and Accessories	15.3
901	Federal Government	11.8
357	Computer and Office Equipment	5.6
366	Communication Equipment	4.5
382	Measuring and Controlling Devices	3.9
731	Advertising	2.9
806	Hospitals	2.4
361	Electric Distribution Equipment	1.7
386	Photographic Equipment and Supplies	1.7
737	Computer and Data Processing Services	1.4

## Occupational Earnings

Salaries for new hires start at around \$21,000.

## Employment Outlook

Opportunities for purchasing agents are expected to grow at a modest rate of about 17 percent through 1995. Growth is anticipated in health care, but the number of openings in high technology, manufacturing, and government will depend on continued stability in those industries.

Average employment growth is expected for purchasing agents. Many opportunities should arise as manufacturers rely on these workers to keep production costs down and as service producing industries, particularly hospitals, schools, and government recognize the importance of purchasing agents in reducing costs. However, the computerization of purchasing coupled with an increased reliance on a small number of suppliers should boost the productivity of purchasing personnel. These changing business practices will place restrictions on future occupational growth.

Those who have a master's degree in business administration and a bachelor's degree in purchasing, or in engineering, science, or business administration with courses in purchasing should have the best opportunities.

## Related Occupations

Industrial Buyer  
Contract Administrator

Wholesale Sales  
Representative

## **Institutions Providing Training in Massachusetts**

Boston College  
Evening Division  
Fulton Hall  
Chestnut Hill, MA  
(617) 552-3900

Chamberlayne Junior College  
12 Commonwealth Avenue  
Boston, MA 02116  
(617) 536-4500

Middlesex Community College  
Springs Road  
Bedford, MA 01730  
(617) 275-8910

Northeastern University  
University College  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2400

## **Radiologic Technologist**

Radiologic technologists operate equipment that is designed to diagnose medical problems and treat patients. These technologists have been known for some years as X-ray technologists; but they now often use other kinds of imaging technologies such as ultrasound and nuclear magnetic resonance, in addition to radiologic equipment, and thus have come to be called radiologic technologists. The diagnostic imaging equipment they operate includes X-ray machines, computerized axial tomography (CAT) scanners, and ultrasonic scanners, which help to diagnose problems by creating images of patients' internal organs and body tissues. The technologists who provide therapy to patients use other kinds of sophisticated equipment to transmit radiation.

The field of radiologic technology includes several specialized occupations: radiographers, also called radiologic technicians or X-ray technicians, who take X-ray films of different parts of the body for diagnosing medical problems; nuclear medical technologists, who use radiopharmaceuticals in diagnosis and treatment; radiation therapy technologists, who administer radiation to cancer patients; and ultrasound technologists, who record images of patients' bodies (usually cardiac and prenatal patients) with equipment that transmits sound waves at high frequencies. In each specialty, technologists prepare information for interpretation and diagnosis by physicians; any treatment or examination of patients is performed according to instructions from physicians.

Radiologic technologists must follow regulations covering the use of radiation very carefully. Although federal legislation sets standards for training and the safe use of radiography, workers in the field face potential radiation hazards. These hazards may be reduced with safety devices like shields and badges measuring radiation levels.

In 1984, approximately 3,400 people were employed as radiologic technicians and technologists in Massachusetts. The majority of radiation therapy, ultrasound, and nuclear medicine technologists in Massachusetts work in radiology departments of hospitals and clinics. Most radiographers (70 percent) also work in hospitals, although about one-quarter work in doctors' offices; and a small number work in either dentists' offices, outpatient care facilities, or laboratories. These jobs usually involve a forty-hour work week that includes evening and weekend or on-call hours. However, radiographers often work part-time.

### **Education, Training, and Hiring Requirements**

Formal training programs are generally required for each specialty within radiologic technology (although technicians working in physicians' offices may receive on-the-job training). Associate's degree programs in nuclear medicine, radiation therapy, diagnostic medical sonography (ultrasound), and radiography are offered at several community colleges in Massachusetts. Bachelor's degree programs in nuclear medicine technology are also available at state and private colleges.

In addition, a few hospitals offer certificate training programs for radiographers. Certificate programs may offer opportunities for trained radiologic technologists to specialize within the field or for other interested health professionals to change fields. These training programs often prefer that applicants have some background in a health profession.

Trained radiologic technologists can be registered by the American Registry of Radiologic Technologists, and credentials are also awarded by the Nuclear Medicine Technology Certification Board and the American Registry of Diagnostic Medical Sonographers. A license is not required for these occupations in Massachusetts.

### **Industries That Employ Radiologic Technologists**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
806	Hospitals	79.0
801	Offices & Clinics of Medical Doctors	13.6
901	Federal Government	4.5

### **Occupational Earnings**

The salaries of radiologic technologists and technicians vary according to education, experience, and location; those with more specialized skills usually earn more. Annual salaries of nuclear medical and ultrasound technologists are between



\$20,000 and \$28,000. Radiographers' salaries are at a slightly lower range, between \$17,000 and \$24,000, although radiography supervisors earn more (an average of \$28,000). Average earnings for radiation therapy technologists are close to \$25,000.

### **Employment Outlook**

Overall, employment among radiologic technologists and technicians is projected to grow in Massachusetts, although the outlook for each specialty within the occupation is varied. Radiographers may face greater competition for available jobs, particularly in urban areas, due to a concentration of trained professionals in these areas. The demand for more specialized radiation therapy and therefore for nuclear medicine technologists is expected to be strong, in part because of the growing demand for diagnosis and treatment for cancer patients. Advances in medical technology may also generate new job opportunities, particularly in outpatient settings. The use of ultrasound tests is expected to increase in hospitals and in other health care settings such as doctors' offices and health maintenance organizations. Some employers train existing staff to use ultrasound equipment and thus may limit growth in new job opportunities. Trends in the hospital industry will have an important effect on each of these occupations, particularly if hospitals attempt to control costs by limiting the use of diagnostic radiology services, limiting purchases of expensive equipment, and cross-training staff.

Employment in this occupation is expected to grow much faster than average as radiologic technologies play an even greater role in the diagnosis and treatment of disease.

In the years ahead, a growing number of radiologic technologists will find jobs in offices of physicians, health maintenance organizations, diagnostic imaging centers, and free standing cancer clinics. Facilities such as these are expected to experience exceptionally rapid growth. However, technologist employment is not expected to grow as fast as these industries because radiologic procedures in nonhospital settings sometimes are performed by physicians, nurses, medical assistants, and other personnel.

### **Related Occupations**

Radiologic Technologist  
X-Ray Technician

Nuclear Medicine Technician

## **Institutions Providing Training in Massachusetts**

### ***Two-Year (Associate's) Degree:***

Bunker Hill Community College  
New Rutherford Avenue  
Charlestown, MA 02129  
(617) 241-8600

Holyoke Community College  
303 Homestead Avenue  
Holyoke, MA 01040  
(413) 538-7000

Laboure' College  
2120 Dorchester Avenue  
Boston, MA 02124  
(617) 296-8300

Massachusetts Bay Community  
College  
50 Oakland Street  
Wellesley Hills, MA 02181  
(617) 237-1100

Massachusetts College of Pharmacy  
and Allied Health Sciences  
179 Longwood Avenue  
Boston, MA 02115  
(617) 732-2800

North Shore Community College  
3 Essex Street  
Beverly, MA 01915  
(508) 927-4850

Northern Essex Community College  
100 Elliot Street  
Haverhill, MA 01830  
(508) 374-0721

Quinsigamond Community College  
670 West Boylston Street  
Worcester, MA 01606  
(508) 853-2300

Springfield Technical Community  
College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

### ***Four-Year (Bachelor's) Degree:***

University of Lowell  
Dugan Hall  
One University Avenue  
Lowell, MA 01854  
(508) 452-5000

### **Where to Write for More Information:**

American Society of Radiologic  
Technologists  
15000 Central Avenue, S.E.  
Albuquerque, NM 87123

Society of Nuclear Medicine  
136 Madison Avenue  
New York, NY 10016

Society of Diagnostic Medical  
Sonographers  
10300 N. Central Expressway  
Building 1, Suite 276  
Dallas, TX 75231

Vice President for Professional  
Education  
American Cancer Society  
90 Park Avenue  
New York, NY 10016

Division of Allied Health  
Education and Accreditation  
American Medical Association  
535 N. Dearborn Street  
Chicago, IL 60610

### **Real Estate Agent or Broker**

Workers in this occupation help individual and business clients buy, sell, and manage property. Although technically a sales occupation, real estate has become more diverse, more competitive, and more closely allied with finance and investment as rapid expansion in the service sector, higher individual incomes, and a wider range of financial options have changed the way individuals, as well as corporations, look at property ownership. A wide range of career opportunities exists in real estate; new job titles and specialties are emerging in the areas of sales, development, and property management. Among real estate occupations, however, the largest and fastest growing area is still real estate sales.

Real estate agents act as intermediaries between property owners and buyers. Working under the auspices of an agency, these workers actively seek out properties or "listings," show them to potential buyers, and assist with many of the details involved in making a real estate purchase. In return, agents receive a percentage of the sale or a commission. Brokers perform the same duties as agents but have the additional training and certification necessary to operate their own agencies, under their own names or according to a franchise agreement with a national chain.

Real estate agents, and brokers who work for someone else, are independent salespeople who receive office space, equipment, and services such as secretarial and advertising support from an agency in return for a share of the commission on each sale. Commission rates on real estate sales range from about four to eight percent.



In Massachusetts there is no set formula for determining how agencies divide that commission with their agents. Individual agencies decide the commission they will charge owners for the sale of properties, the percentage of that fee they will share with both the listing and selling agents, and how much they will pay other realty companies, called "sub-agencies," who have participated in the sale. For example, if a sales representative from an agency which charges a six-percent commission lists a property for \$100,000 and another agent from the same or a competing agency sells the property for that amount, the listing agency receives a large portion of the \$6,000 commission (as much as 50 percent or more) and the agents split the remainder according to the formula established by the listing agency.

### **Education, Training, and Hiring Requirements**

Real estate agents must be licensed by the state. In order to obtain a license to sell real estate in Massachusetts, individuals are required to take twenty-four hours of classroom instruction and pass the state examination. Licensed sales agents who wish to become brokers must take thirty hours of instruction and pass the broker's exam. The required classes are offered by fifty-four colleges, universities, and private vendors across the state. A list of locations can be obtained from the Massachusetts Board of Registration of Real Estate Brokers and Salesmen in Boston (address below).

Four year-degrees are becoming the norm in real estate sales. Opportunities in commercial development are highly competitive and some firms are beginning to require both prior experience and an M.B.A. Specific training is acquired on the job and through workshops and institutes that may or may not be paid for by the agency.

In addition to the costs associated with licensing, candidates should consider the costs associated with practicing real estate. Experienced realtors suggest that new entrants to the field avail themselves of the week-long seminars offered by the Graduate Realtors Institute during their first year to get ready for the broker's examination. In Massachusetts, most agents and brokers belong to the Massachusetts Association of Realtors, a professional affiliation which costs around \$260 a year. To obtain the right to show listings outside their own agencies, realtors must subscribe to the Multiple Listings Service (MLS), which costs an additional \$400 a year.

Success in real estate sales requires an energetic and outgoing personality. Candidates should be self-starters who truly enjoy selling and whose enthusiasm can sustain them over lean periods like the winter months when there are few sales. Courses in business math, finance and investments, economic development, marketing, interpersonal communication, and psychology would be useful for anyone considering the field. Summer jobs in sales and promotion or the experience of operating a small business while still in school would be highly beneficial.

## Industries That Employ Real Estate Agents and Brokers

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
653	Real Estate Agents and Managers	61.9
651	Real Estate Operators and Lessors	31.4

### Occupational Earnings

Brokers say that in addition to individual drive and sales ability, first-year earnings depend on the agency/agent split, the location of the agency and its share of the local market, the amount of "floor time" new agents are allotted (that is, the opportunity to take walk-ins who have not asked to see a particular broker), and economic factors like tax laws and interest rates. Favorable economic conditions in 1986 made it possible for new agents to earn between \$20,000 and \$30,000.

As independent contractors, real estate agents and brokers receive no fringe benefits and are not considered employees of their agencies. Although residential real estate was once viewed as an attractive part-time option for homemakers, it has become a highly organized, competitive, and potentially lucrative full-time occupation. Successful agents put in long hours, including nights and weekends when clients are available to view properties. Real estate sales is active and often physically challenging. Agents divide their time between the office, where they develop leads on both properties and prospective clients, and the field, where they appraise properties, take listings, and show properties, often without regard to time of year or weather. Condominium sales agents sometimes work out of one location at a time by using direct mail to bring prospective customers to the site. Residential sales requires a knowledge of the local real estate market; features of interest to buyers such as commuting routes, schools, and shopping centers; relevant state and federal laws; and some familiarity with zoning, bank practices, and personal finance.

In commercial and industrial real estate, the issues are more complex, the degree of knowledge required more sophisticated, and the financial rewards greater. Some firms concentrate on specific types of commercial real estate. Liberty Properties of Boston, for example, specializes in the reuse of older industrial space. Putting together a commercial sale may involve complicated financing arrangements, zoning variances, approvals from state and local government agencies, and agreements between corporate entities -- tasks which clearly involve experience beyond the entry level. Large commercial development firms, however, sometimes hire people who lack sales experience for administrative or research positions in rental services or data coordination. A data coordinator may research available properties, compute vacancy



rates or prepare reports on space users for brokers to use in developing leads. After gaining experience and acquiring a real estate license, a data coordinator may advance to broker trainee, a salaried position which pays around \$16,000 a year, and eventually become a broker.

### **Employment Outlook**

Real estate sales is one of the fastest growing fields in the Commonwealth. In 1984 there were 5,190 sales agents in Massachusetts, and state sources expect that over 1,300 new jobs will be created by 1995. The rate of expansion in residential sales will be heavily influenced by personal income, tax laws, and interest rates. According to the Associated Industries of Massachusetts (AIM), there is currently an "over-supply" of industrial real estate in the state. However, this three-to-four year supply of industrial space is being steadily absorbed by businesses who see this as a time to strike exceptionally favorable deals.

### **Related Occupations**

Rental Coordinator (residential and commercial)

Data Coordinator (commercial)

Research Assistant (condominium development)

### **Institutions Providing Training in Massachusetts**

American Real Estate Academy  
771 Main Street  
Waltham, MA 02154  
(617) 893-2832

Bentley College  
Waltham, MA 02154  
(617) 891-2135

R.J. Feriolo, Inc.  
85 Somoset Street  
Plymouth, MA 02360

Greater Springfield Board of Realtors  
185 Industry Avenue  
Springfield, MA 01104

Holyoke Community College  
303 Homestead Avenue  
Holyoke, MA 01040

Braintree Public Schools  
482 Washington Street  
Braintree, MA 02184

The Foundation for Continuing  
Education  
P.O. Box 458  
Wenham, MA 01984  
(508) 468-4136

Cape Cod Real Estate School, Inc.  
507 Main Street  
Hyannis, MA 02601



J.P. Keefe, Tech. School  
750 Winter Street  
Framingham, MA 01701  
(508) 879-5400

Lee Institute  
3110 Harvard Street  
Brookline, MA 02146  
(617) 734-3211

Massachusetts Association of  
Realtors  
400 Totten Pond Road  
Waltham, MA 02154  
(617) 890-3700

Middlesex Community College  
Springs Road  
Bedford, MA 01730  
(617) 275-8910

Stonehill College  
North Easton, MA 02356

Smith-McLaughlin-Hart  
195 State Street  
Boston, MA 02109  
(617) 742-3900

Sullivan Real Estate School  
Route 132  
Hyannis, MA 02601  
(508) 774-1466

Richard S. Thomas R.E. School  
1255 Westfield Street  
West Springfield, MA 01089  
MA 01089  
(413) 739-2156

University of Massachusetts  
Division of Continuing Education  
Amherst, MA 01003

Harris Real Estate School  
144 Turnpike Street  
Rowley, MA 01969

Carlson Real Estate Pre-  
Licensing School  
209 Washington Street  
Salem, MA 01970

North Reading High School  
Occupational Education  
Brokers & Sales Course  
North Reading, MA 01864

Greenfield Community College  
Division of Business Administration,  
Sales Course  
Greenfield, MA 01301

Mount Wachusett Community  
College  
Division of Continuing Education &  
Community Service  
Sales Course  
Gardner, MA 01440

Falmouth Public Schools  
Evening Division  
Sales Course  
874 Gifford Street  
Falmouth, MA 02540

Newton Public Schools  
Division of Continuing Education,  
Brokers & Sales Course  
360 Lowell Avenue  
Newtonville, MA 02160

Northeastern University  
360 Huntington Avenue  
Sales Course  
Boston, MA 02115

Worcester Public School  
Extension Program  
20 Irving Street  
Worcester, MA 01609

Quincy Junior College  
34 Coddington Street  
Quincy, MA 02169

Springfield Technical Community  
College  
One Armory Square  
Springfield, MA 01105  
(413) 781-6470

Cape Cod Community College  
West Barnstable, MA 02668  
(508) 362-2131

Essex County Adult Education  
Center  
Danvers Y.M.C.A.  
Box 445  
Danvers, MA 01923

North Shore Community College  
Beverly, MA 01915

Brown's Realty School  
34 Main Street  
P.O. Box 9  
Ayer MA 01432  
(508) 7742-4934

Horizon Real Estate School  
127 South Franklin Street  
Holbrook, MA 02343  
(617) 767-3500

Massachusetts Bay Community  
College  
50 Oakland Street  
Wellesley, MA 02181

Quinsigamond Community College  
Center for Lifelong Learning  
Sales Course  
670 West Boylston Street  
Worcester, MA 01606

Landry, Lyons & Whyte  
Real Estate School  
232 Park Street  
Sales Course  
West Springfield, MA 01089

Mount Ida Junior College  
Evening Division of Continuing  
Education, Sales Course  
777 Dedham Street  
Newton Center, MA 02150

Bunker Hill Community College  
Division of Continuing Education  
Brokers Course  
Charlestown, MA 02129

Conway Country School of Real  
Estate  
Brokers Course  
182 Columbia Road  
Hanover, MA 02339

Bristol Community College  
Brokers Course  
777 Elsbree Street  
Fall River, MA 02720

Lincoln-Sudbury Regional School  
District, Adult Education  
Sales Course  
390 Lincoln Road  
Sudbury, MA 01776

South Hadley High School  
Adult Education  
Brokers & Sales Course  
South Hadley, MA 01075

University of Lowell  
One University Avenue  
Lowell, MA 01854  
(508) 452-5000

University of Massachusetts  
School of Business Administration  
Amherst, MA 01003

Greater Brockton Multiple Listing  
Service Real Estate School  
16 Belmont Street  
South Easton, MA 02375

Bay State Realty Academy  
27 Midstate Drive  
Midstate Office Park  
Auburn, MA 01501

Becker Junior College  
61 Sever Street  
Worcester, MA 01609  
(508) 755-4314

Salem State College  
Division of Graduate and  
Continuing Education  
Salesman's Course  
Salem, MA 01970

Fisher Junior College  
29 Beacon Street  
Boston, MA 02116  
(617) 262-3240

Sandwich Community School  
Quaker Meeting House  
East Sandwich, MA 02537  
(508) 888-5300

Spencer Group  
377 Elliot Street  
Newton Upper Falls, MA 02164

Dean Junior College  
Brokers Course  
Franklin, MA 02038

Somerville High School  
Sales Course  
81 Highland Avenue  
Somerville, MA 02143

Towne House Realty School  
Sales Course  
77 State Road  
North Dartmouth, MA 02747

Real Estate Salesman School  
Sales Course  
1839 Memorial Drive  
Chicopee, MA 01020

Northern Essex Community College  
Brokers & Sales Course  
Elliot Street  
Haverhill, MA 01830

Brookline Public Schools  
Sales Course  
115 Greenough Street  
Brookline, MA

Bridgewater State College  
Sales Course  
Bridgewater, MA 02324

Hingham Public Schools  
Sales Course  
14 Main Street  
Hingham, MA 02043

Central New England College  
Brokers & Sales Course  
768 Main Street  
Worcester, MA 01610  
(508) 791-8241



Roxbury Community College  
625 Huntington Avenue  
Boston, MA 02115  
(617) 734-1960

Marian Court Junior College  
35 Littles Point Road  
Swampscott, MA 01907  
(617) 595-6768

Massasoit Community College  
100 Randolph Street  
Canton, MA 02021  
(617) 588-9100

Scituate Evening School  
606 Chief Justice Cushing Way  
Scituate, MA 02066

Massachusetts License  
Preparation Inc.  
6 Liberty Road  
Marshfield, MA  
(617) 834-9600

Methuen High School  
One Ranger Road  
Methuen, MA 01844  
(508) 681-1357

Coldwell Banker Real  
Estate School  
366 Washington Street  
Wellesley Hills, MA 02181

Franklin Institute of Boston  
41 Berkeley Street  
Boston, MA 02116-6296

Epcot Realty & Finance  
211 Prospect Street  
Cambridge, MA 02139

Massachusetts Maritime Academy  
P.O. Box D  
Buzzards Bay, MA 02532

Foster & Foster Real Estate School  
394 Massachusetts Avenue  
Acton, MA 01720

Boston Center for Adult Education  
5 Commonwealth Avenue  
Boston, MA

Blue Hills Regional Technical School  
Sales Course  
800 Randolph Street  
Canton, MA 02021  
(617) 828-5800

Massachusetts Realty Institute  
Brokers & Sales Course  
5 Arlington Street  
Boston, MA 02116

Berkshire Community College  
Sales Course  
West Street  
Pittsfield, MA 01201

New England Real Estate School  
Sales Course  
379 Rock-O-Dundee Road  
South Dartmouth, MA 02748

Kinyon-Campbell Business School  
Brokers & Sales Course  
69 Linden Street  
New Bedford, MA 02740

Medford Public Schools  
Sales Course  
489 Winthrop Street  
Medford, MA 02155

**Hunneman Real Estate Career  
Center Inc.  
Brokers & Sales Course  
825 Beacon Street, Suite 14  
Newton Centre, MA 02159**

**W.F. Murray Realty Enterprises  
Brokers & Sales Course  
56 Elm Street  
Pittsfield, MA 01201  
(413) 442-1163**

### **Where to Write for More Information**

**Mass. Board of Registration of  
Real Estate Brokers and Salesmen  
100 Cambridge Street, Room 1518  
Boston, MA 02202**

**Massachusetts Association of  
Realtors  
460 Totten Pond Road  
Waltham, MA**

## **Receptionist**

Receptionists are the first point of contact in many organizations. They greet visitors, answer incoming calls, and make referrals to departments and personnel within an organization. Many receptionists operate switchboards and perform routine clerical tasks such as responding to inquiries regarding products, services, or policies; opening and distributing mail; making appointments; and typing.

Receptionists can be found in any large, medium-sized, or small organization which has enough volume to warrant hiring someone to control the flow of traffic. In 1985 there were 13,969 receptionists and related workers in Massachusetts. Nearly one-third were employed by medical facilities, either in hospitals or physicians' or dentists' offices. Law offices, academic institutions, and miscellaneous business services were also major employers. Most of the opportunities for receptionists occur in and around major cities, particularly in Boston, which has the highest concentration of these industries.

### **Education, Training, and Hiring Requirements**

Beyond a high school diploma, there is usually little training required for switchboard operators and receptionists. Good interpersonal skills, a pleasant telephone and personal manner, and the ability to handle more than one inquiry at a time are the most important qualifications for the job. Those considering the occupation should enjoy a high degree of public contact. Candidates must be polite but assertive when screening calls and visitors. Because they often work alone in reception areas separated from the rest of the offices in the organization, receptionists must be able to work with a minimum of direct supervision.

Receptionists are in a good position to get to know managers, to be observed by them, and to learn about internal openings. With satisfactory job performance and additional education and training, receptionists can often obtain better paying office jobs.

### **Industries That Employ Receptionists**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
801	Offices & Clinics of Medical Doctors	11.7
802	Offices and Clinics of Dentists	9.4
806	Hospitals	7.2
736	Personnel Supply Services	5.2
723	Beauty Shops	2.7
811	Legal Services	2.5
737	Computer and Data Processing Services	2.3
739	Miscellaneous Business Services	2.2
804	Offices of Other Health Practitioners	2.1
701	Hotels and Motels	1.9

### **Occupational Earnings**

Salaries for new entrants range from \$200 to \$250 a week, depending upon the size and type of organization. Experienced workers can make as much as \$325 a week.

### **Employment Outlook**

The outlook for both receptionists and switchboard operators is favorable as existing businesses like banks and insurance companies continue to expand and diversify and new ones come into existence.

Employment of receptionists is expected to grow much faster than average because so many in this occupation work for firms providing business or professional services -- sectors of the economy that are expected to exhibit strong growth -- particularly doctors' and dentists' offices, law firms, temporary help agencies, and consulting firms. In addition, more and more firms recognize the importance of these workers in promoting good public relations.

Since many receptionists and information clerks also perform secretarial duties, persons with good typing, stenographic, and other skills should have the best job prospects.



## **Related Occupations**

Information Clerk

Scheduler

Telephone - Quotation Clerk

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Bay State Junior College  
122 Commonwealth Avenue  
Boston, MA 02116  
(617) 236-8000

Boston Public Evening Schools  
Department of Adult Education  
60 Hawthorne Street  
Roslindale, MA  
(617) 323-4166

Henry O. Peabody School  
Peabody Road  
Norwood, MA 02062  
(617) 762-5537

Hickox Secretarial School  
200 Tremont Street  
Boston, MA 02116  
(617) 482-7655

Katharine Gibbs School  
86 Beacon Street  
Boston, MA 02116  
(617) 482-7655

Quincy Junior College  
34 Coddington Street  
Quincy, MA 02169  
(617) 984-1600

Somerville Center of  
Adult Learning  
99 Dover Street  
Somerville, MA  
(617) 625-1335

Dudley Hall Career Institute  
258-260 West Main Street  
Dudley, MA 01570

Dudley Hall of Worcester  
16 Washington Square  
Worcester, MA 01604  
(508) 754-6699

Boston Technical Center, Inc.  
Boston Marine Industrial Park  
22 Drydock Avenue, Bldg. 49  
Boston, MA 02210  
(617) 482-9273

**SKILLS**  
24 South Prospect Street  
Amherst, MA 01002  
(413) 253-9500

American Business Institute  
17 Winter Street  
Boston, MA 02108  
(617) 338-1033

Boston Business School  
989 Commonwealth Avenue  
Boston, MA 02215  
(617) 787-5600

Burdett School  
372 Stuart Street  
Boston, MA 02116  
(617) 267-7435

## Recreational Therapist

Recreational therapists, along with art, music, and dance therapists, use art and leisure activities as a form of treatment for patients who have physical, mental, or emotional disabilities or illness. Recreational and expressive therapy are used to help patients master everyday life skills, build confidence, develop social skills, and express themselves. Therapists plan and organize group and individual activities for patients that are suited to their particular needs. These therapists often work with a team of other health professionals, who together plan treatments and monitor patients' progress.

Many recreational therapists work in rehabilitation or psychiatric hospitals, as well as nursing homes, residential care facilities, and community mental health centers. These therapists also help provide family respite care by organizing outings for disabled or retarded people living at home. Some therapists work at camps or programs for special needs children. Nursing homes sometimes employ recreational therapists as activities directors or hire them to consult with activities staff.

### Education, Training, and Hiring Requirements

Most recreational therapists hold a bachelor's degree in psychology, social work, or therapeutic recreation. A degree specifically in recreational therapy is becoming more and more expected for jobs in hospitals and community settings. (Nursing home activities coordinators are not currently required to have a degree in therapeutic recreation.) Recreational therapists in any setting must be patient, caring, and imaginative in planning activities which will respond to patients' needs.

### Industries That Employ Recreational Therapists

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
805	Nursing and Personal Care Facilities	71.3
806	Hospitals	20.3

### Occupational Earnings

There were approximately 1,200 recreational therapists working in Massachusetts in 1984. Salaries range from about \$17,000 to \$24,000 per year, depending on experience, with the typical salary being approximately \$19,000. Some recreational therapists, particularly in nursing homes, work part-time.

## **Employment Outlook**

Job opportunities for recreational therapists are expected to be excellent throughout the mid-1990s. As the population ages and the deinstitutionalization of mental patients continues, there will be a growing need for recreational therapists in nursing homes and community programs. Because third-party reimbursement for recreational therapy services is limited, however, hospitals may be less likely to offer staff positions for recreational therapists. Most employment growth will probably be outside of hospitals, with the exception of private psychiatric hospitals, which are expected to continue to expand.

Employment of recreational therapists is expected to grow much faster than average chiefly because of the anticipated expansion of long term care facilities and services. Job prospects will remain favorable for these workers because of the rising demand for therapeutic and mental health services in nursing homes, psychiatric hospitals, and community programs for the elderly, mentally ill, and developmentally disabled.

With the number of those 65 years of age and above doubling over the decade, more people will be prone to debilitating conditions that will require recreational therapy.

## **Related Occupations**

Art Therapist

Dance Therapist

Music Therapist

## **Institutions Providing Training in Massachusetts**

### *Four-Year (Bachelor's) Degree:*

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2000

Springfield College  
263 Alden Street  
Springfield, MA 01109  
(413) 788-3136

## **Where to Write for More Information:**

National Therapeutic Recreation  
Society  
3101 Park Center Drive  
Alexandria, VA 22302

Public Inquiries  
National Institute of  
Mental Health  
5600 Fishers Lane  
Rockville, MD 20857



National Council for Therapeutic  
Recreation Certification  
P.O. Box 16126  
Alexandria, VA 22302

American Health Care Association  
1200 15th Street, N.W.  
Washington, DC 20005

American Association on Health,  
Physical Education, Recreation  
and Dance  
P.O. Box 704  
Waldorf, MD 20601

National Recreation and Park  
Association  
3101 Park Center Drive  
Alexandria, VA 22302

## **Respiratory Therapist or Technician**

Respiratory therapists provide treatment to patients who have difficulty breathing due to heart and lung problems. They often respond to emergencies, treating victims of heart failure, drowning, or shock; but they also care for patients with chronic conditions like asthma or emphysema. Respiratory care involves administering oxygen, keeping the respiratory tract moist with humidity and aerosol mists, clearing lungs and helping patients to breathe more easily, and operating mechanical ventilators. In addition to administering treatments and setting up and monitoring special equipment like ventilators, respiratory therapists also help with diagnostic procedures that measure blood oxygen levels or air volume in the lungs.

In many cases, patients who need oxygen can be treated by respiratory therapists in their own homes. Therapists also teach patients and families how to use ventilators and other more sophisticated equipment at home and help to maintain and repair the equipment. Therapists keep records of patient progress and materials used. Some therapists supervise respiratory technicians and assistants. The work can be stressful, particularly when therapists assist in emergency situations.

Almost all respiratory therapists in Massachusetts (91 percent) work in hospitals, and a small share work in nursing homes and other health practitioners' offices. Often the therapist's forty-hour work week involves evening or weekend hours.

Hospitals typically employ respiratory technicians, certified respiratory therapy technicians, and registered respiratory therapists. Technicians who are not certified are limited in providing direct patient care but work with the same equipment as certified technicians and therapists. Certified technicians and registered therapists have similar job responsibilities, but registered therapists earn more and have better chances of upward mobility.

Therapists who gain clinical skills and experience can advance to providing care for patients with more complex problems, and can also move into supervisory or management positions.

### **Education, Training, and Hiring Requirements**

Postsecondary training is required for all respiratory therapy workers, through either a two-year associate's degree or four-year bachelor's degree program. Respiratory technicians generally have an associates degree and become certified by passing an examination. Registered therapists must have a bachelor's degree and must also sit for an exam.

### **Industries That Employ Respiratory Therapists and Technicians**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
806	Hospitals	94.0
809	Health and Allied Services	5.0

### **Occupational Earnings**

Registered therapists earn between \$18,000 and \$25,000 annually. Certified respiratory therapy technicians salaries are in the range of \$16,000 to \$23,000, while uncertified technicians can earn between \$15,000 and \$21,000.

### **Employment Outlook**

Approximately 1,800 respiratory therapists worked in Massachusetts in 1984. Employment in this occupation is expected to grow about 20 percent by the mid-1990s. The demand for respiratory therapy services is likely to continue, due largely to a rapidly growing older population and increasing incidence of cardiopulmonary diseases. Due to pressures to limit costs, however, there will probably be changes in the type and amount of respiratory care provided in hospitals. Hospitals may also change staffing patterns -- replacing respiratory therapists with technicians or registered nurses -- in order to cut labor costs. Job prospects for respiratory therapists are likely to be good in the home health care field, particularly in hospital-based programs, although this industry represents a relatively small share of therapist jobs.

**Related Occupations**

Dialysis Technician  
Emergency Medical Technician  
Registered Nurse

Occupational Therapist  
Physical Therapist

**Institutions Providing Training in Massachusetts***Two-Year (Associate's) Degree:*

Berkshire Community College  
West Street  
Pittsfield, MA 01201  
(413) 499-4660

Laboure Junior College  
Boston, MA 02124  
(617) 296-8300

Massasoit Community College  
One Massasoit Boulevard  
Brockton, MA 02402  
(508) 588-9100

Newbury Junior College  
921 Boylston Street  
Boston, MA 02115  
(617) 262-9350

North Shore Community College  
3 Essex Street  
Beverly, MA 01915  
(508) 927-4850

Northern Essex Community College  
100 Elliot Street  
Haverhill, MA 01830  
(617) 374-0721

Quinsigamond Community College  
670 West Boylston Street  
Worcester, MA 01606  
(508) 853-2300

Springfield Technical Community  
College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

*Four-Year (Bachelor's) Degree:*

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2000



## **Where to Write for More Information:**

American Association for  
Respiratory Therapy  
1720 Regal Row  
Suite 112  
Dallas, TX 75221

Joint Review Committee for  
Respiratory Therapy Education  
Suite 200  
1701 W. Eulless Boulevard  
Eulless, TX 76040

The National Board for  
Respiratory Care, Inc.  
11015 West 75th Terrace  
Shawnee Mission, KS 66214

## **Restaurant Manager**

Restaurant management is a complex and demanding occupation. Like other management professionals, restaurant managers hire, train, and direct staff; develop work schedules; and implement company personnel policies. Restaurant managers prepare budgets, maintain financial records, produce reports, control costs, and maintain inventories. Depending upon the nature of the restaurant, managers may be involved in developing the advertising campaigns and promotional materials necessary to attract customers. On the culinary side, managers plan (or help to plan) menus; purchase food, supplies, and equipment; and are responsible for quality control. They must be familiar with basic nutrition and food storage principles and the laws and regulations which govern licensing, health, and sanitation in the food service workplace. Public relations is a very important part of the restaurant manager's job. Creating a welcome atmosphere for patrons and responding to their concerns diplomatically are essential qualities.

## **Education, Training, and Hiring Requirements**

Many applicants with a bachelor's degree enter the field through training programs offered by large restaurant and hotel chains. Training opportunities range from formal classroom instruction to several weeks of supervised experience in a training facility. Depending upon the size of the company, successful managers can sometimes rotate into finance or human resource positions at headquarters after several years' experience in the field. Many of the nationally known restaurant chains are owned by large corporations; in that case, skilled managers have an even wider range of promotional opportunities.

## Industries That Employ Restaurant Managers

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
580	Eating & Drinking Establishments	65.5
700	Hotels and Other Lodging	12.7
820	Education	4.6
791, 9	All Other Amusement and Recreation	2.5
806	Hospitals	2.2

### Occupational Earnings

Annual pay for restaurant and lodging managers average about \$23,000 per year. Managers in fast food restaurants earn an average of about \$20,000 per year.

### Employment Outlook

The demand for restaurant managers is expected to be better than average in the coming years. There were 13,700 people employed in restaurant management in Massachusetts in 1984 and this figure is expected to rise to 17,360, an increase of over 26 percent, by 1995.

Employment of restaurant managers is expected to increase faster than average with the growth in the number of eating and drinking establishments. Population growth, rising personal incomes, and increased leisure time will continue to produce growth in the number of meals consumed outside the home. Also, continued growth in the number of families in which both spouses work should make dining out a more frequent and affordable convenience.

Job opportunities are expected to be best for persons with bachelor's or associate's degrees in restaurant and institutional food service management.

### Related Occupations

Cafeteria Manager (institutional foods)  
Catering Manager (hotels, clubs)

Food Service Manager  
(hotels)

## **Institutions Providing Training in Massachusetts**

### ***Two-Year (Associate's) Degree:***

Bay Path Junior College  
588 Longmeadow Street  
Longmeadow, MA 01106  
(413) 567-0621

Bay State Junior College  
122 Commonwealth Avenue  
Boston, MA 02116  
(617) 236-8000

Becker Junior College--Worcester  
61 Sever Street  
Worcester, MA 01690  
(508) 791-9241

Berkshire Community College  
West Street  
Pittsfield, MA 01201  
(413) 499-4660

Bunker Hill Community College  
New Rutherford Avenue  
Charlestown, MA 02129  
(617) 241-8600

Cape Cod Community College  
Route 132  
West Barnstable, MA 02668  
(508) 362-2131

Chamberlayne Junior College  
128 Commonwealth Avenue  
Boston, MA 02116  
(617) 536-4500

Endicott College  
376 Hale Street  
Beverly, MA 01915  
(508) 927-0585

Essex Agricultural and Technical  
Institute/Collegiate Division  
Route 62  
Danvers, MA 01923  
(508) 774-0050

Fisher Junior College  
118 Beacon Street  
Boston, MA 02116  
(617) 262-3240

Holyoke Community College  
303 Homestead Avenue  
Holyoke, MA 01040  
(413) 538-7000

Middlesex Community College  
Springs Road  
Bedford, MA 01730  
(617) 275-8910

Newbury Junior College  
921 Boylston Street  
Boston, MA 02115  
(617) 262-9350

Quincy Junior College  
34 Coddington Street  
Quincy, MA 02169  
(617) 786-8799

Quinsigamond Community College  
670 West Boylston Street  
Worcester, MA 01606  
(508) 853-2300

Roxbury Community College  
650 Huntington Avenue  
Boston, MA 02115  
(617) 734-1960



## **Retail Sales Worker**

Retailing is the business of selling goods and intangible items and services (such as advertising space in print media, banking or accounting services, insurance, or stocks and bonds) directly to the consumer. Whether the product is furniture, electrical appliances, or automobiles, the primary job is to interest customers in the product. Job opportunities exist in large department store chains, small specialty shops, automobile showrooms, and mail-order and direct sales organizations. Some major career areas in the retail industry include direct sales, buying, and management positions.

Retail sales workers deal directly with customers. They provide information on the construction of a product, demonstrate its use, and show various models and colors. Retail sales personnel must be able to make out sales checks, receive cash payments, and give change and receipts. They may help stock shelves, mark price tags, take inventory, and prepare displays. Some positions require technical knowledge or skills. A computer salesperson, for example, must have some special knowledge of computers and computer programs in order to demonstrate to customers the features and various business and personal applications.

For many people, retail sales serves as a source of immediate income rather than a career. Most entrants are under age 25. Many have little or no work experience and are students or homemakers looking for part-time work. Training is usually on-the-job. An interest in sales work, a pleasant personality, a neat appearance, and good communication skills are the biggest assets.

Buyers work for large and small retailers. They must remain aware of the desires of a particular clientele and the goals of the retail organization. This fast-paced and frequently stressful position requires travel to manufacturers' showrooms, factories, merchandise marts, and fashion and trade shows to select items for purchase, negotiate prices and contracts for delivery, and coordinate the distribution of goods to stores. Buyers analyze and make decisions concerning trends and buying habits based on forecasts of manufacturers, trade information, and analyses of past records. They should be organized and demonstrate a willingness to take responsibility for decisions. Some mathematical and computer ability is also helpful.

Most buyers begin as trainees selling merchandise directly to consumers, supervising sales workers, keeping account of stock, and ultimately working as assistant buyers for one or two years. As in other areas of the retail trade, buyers frequently change jobs. Experienced buyers may advance to merchandise managers or assume executive level jobs in department or chain stores.

Managerial positions are found in all levels of the retail industry. Department managers and group managers work in retail stores and are responsible for particular

areas which are distinguishable by the goods sold. They maintain appropriate inventory levels; display products; supervise personnel; and provide buyers, merchandise managers, and store managers with information concerning sales activities. Group managers, who are responsible for more than one department, oversee the activities of department managers and sales personnel. Increasingly responsible levels of management exist in all areas of retailing and are usually progressive within a management training program.

### **Education, Training, and Hiring Requirements**

High school graduates qualify to work as retail sales personnel. Traditionally, capable sales workers without college degrees can advance to management positions. A college education, however, is becoming increasingly more important, particularly for management positions. Large retail establishments typically hire college graduates as management trainees. Vocational schools, technical institutes, and two- and four-year colleges and universities offer post secondary training that prepares students for all areas of the retail trade industry. Through hard work, training, and perseverance, an individual can rise within the ranks through a career in retailing.

### **Industries That Employ Retail Sales Workers**

There are over 86,000 people employed as sales workers in the state of Massachusetts. Of these, 70,440 are employed as sales clerks. Other sales workers include insurance agents and brokers and sales agents representing financial services and technical sales.

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
531	Department Stores	23.9
594	Miscellaneous Shopping Goods	10.7
562	Women's Ready-to-Wear	7.7
551	Motor Vehicle Dealers	4.7
541	Grocery Stores	4.4
566	Shoe Stores	4.0
565	Family Clothing Stores	3.9
571	Furniture, Home Furnishings	2.9

### **Occupational Earnings**

For full-time workers in retail sales, the earnings range from \$170 to \$360 a week. The highest paid workers sell "big ticket" items that earn a commission, such as large appliances and furniture.

## **Employment Outlook**

Employment in retail sales is expected to grow at an average rate into the 1990s and will continue to provide more job openings than almost any other occupation. Typically, there is rapid turnover due to a large number of individuals working temporarily or part-time, as well as full-time employees seeking higher level positions within the industry.

## **Related Occupations**

Travel Agent

Manufacturing Representative

Demonstrator

Route Driver

Telephone Solicitor,

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Dean Junior College  
99 Main Street  
Franklin, MA 02038  
(508) 528-9100

Northern Essex Community College  
Elliot Way  
Haverhill, MA 01830  
(508) 374-3600

Newbury Junior College  
921 Boylston Street  
Boston, MA 02115  
(617) 739-0510  
(and other locations)

North Shore Employment & Training  
10 Orne Street  
Salem, MA 01970

### *Vocational Education Programs:*

See Appendix C

## **Registered Nurse**

Registered nurses (RNs) deal with health maintenance, as well as treatment for illness or injury; and they address patients' mental and emotional, as well as physical, problems. While RNs are responsible for ensuring that medical treatment prescribed by doctors is carried out, they are also trained to assess patients' symptoms and progress, administer medications, and teach patients and families about needed care.

RNs have different specific responsibilities in different work settings. Most of them work as hospital nurses, providing skilled bedside nursing care. These nurses



typically work in areas of a hospital, such as surgery or pediatrics, where groups of patients need similar care. RNs employed in nursing homes care for chronically ill or convalescing patients. Many RNs work as private duty nurses, either in homes or institutional settings, where they are often hired to provide individual care to patients. RNs who work in home health care or in clinics or schools are called community health nurses. Physicians' offices and health maintenance organizations (HMOs) also employ RNs. Occupational health and industrial nurses treat people in the work place and may help with examinations, inoculations, or health promotion programs.

Nurses who seek positions in hospitals must apply through the hospital personnel department, but candidates are also interviewed by the nursing administrator. All licensed RNs are eligible for staff or general-duty nurse jobs, but nursing administrators generally aim to fill a certain share of staff positions with nurses who have earned bachelor's degrees.

In hospitals, RNs can advance through "clinical ladders" as they develop special skills; academic preparation may also be required to advance into some categories. The job of head nurse has been expanded in many hospitals and may include responsibility for overall staffing, coverage of shifts, and budgeting for a particular unit. Clinical supervisors (RNs who usually have master's degrees) provide clinical expertise to staff nurses and may be assigned to cover several units.

RNs can also pursue further education to become nurse practitioners, nurse anesthetists, or nurse midwives. These specialties offer nurses the opportunity to advance within hospitals and also to work on an independent basis. Recent growth among for-profit health care providers such as ambulatory care clinics and marketing and quality assurance firms has allowed some RNs to move into business positions as well.

The total number of RNs employed in Massachusetts is about 57,000. Most work in hospitals and clinics (66 percent), while the remainder are spread throughout the health care industry, in nursing homes (8 percent), doctors' offices (4 percent), nurses' registries (3 percent), and health and allied services such as Visiting Nurse Associations (3 percent). A small share of RN employment is in schools and government sectors.

### **Education, Training, and Hiring Requirements**

RNs must be licensed with the Board of Registration in Nursing in order to practice in Massachusetts. Three types of RN training programs may be pursued in this state. Diploma programs, which require three years, are offered at several hospitals; associate degree programs (two years) are offered at many community colleges; and bachelor's degree programs, requiring four years, are offered at several

public and private colleges. Graduates from any of these programs are eligible to take the RN licensing exam. A bachelor's degree is important for nurses who want to pursue administrative jobs, research, teaching, or clinical specializations. Positions such as nurse practitioner or anesthetist require graduate level preparation, either a certificate or a master's degree.

Hospital nurses are usually required to work eight-hour shifts that often include night rotations, weekends, and holidays. Jobs in other settings, such as doctors' offices and clinics, are more likely to have regular daytime hours. Nurses must have both physical and emotional endurance and an ability to work under stress (particularly in hospitals). RNs who are employed as visiting nurses need the self-confidence and experience to work in more isolated settings and, in some circumstances, to make independent judgments. Often it is expected that RNs right out of school will gain experience by working in a hospital for a few years.

### **Industries That Employ Registered Nurses**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
806	Hospitals	66.1
805	Nursing and Personal Care Facilities	8.0
736	Personnel Supply Services	6.4
809	Health and Allied Services	5.2
801	Offices & Clinics of Medical Doctors	3.7
821	Elementary and Secondary Schools	2.5
901	Federal Government	2.4
808	Home Health Care Services	1.4
902	State Government	1.0

### **Occupational Earnings**

Salaries for RNs vary among hospitals and other settings. Staff RNs in Massachusetts hospitals earn, on average, \$26,000 per year. (The entry level salary is about \$21,000.) Salaries in nursing homes are slightly lower, about \$20,000 for general duty nurses and \$23,000 for head nurses. Those who advance to become a head nurse or supervisor, a nursing instructor, or a nurse practitioner or clinical specialist in a hospital earn between \$30,000 and \$35,000. The highest paid positions are anesthetists and directors of nursing in hospitals, who earn between \$40,000 and \$50,000.

## **Employment Outlook**

Currently the demand for RNs is very high in Massachusetts, particularly in hospitals. Because of cost and regulatory pressures, acute-care hospitals are now more likely to provide care to seriously ill patients for shorter periods of time. These employers seek RNs who are trained to perform a wide range of skilled nursing duties and who can use, or be trained to use, sophisticated equipment. As more patients seek care outside hospitals and as the elderly population grows, the demand for RNs in outpatient ambulatory care, nursing homes, and home health care settings is also growing. Overall employment in this occupation is projected to increase 28 percent by the mid-1990s. Job prospects will also be affected by the fact that fewer numbers of people are entering the nursing field. The combination of strong demand and more limited supply may have a positive effect on wages for RN positions, although the current tight labor market has also resulted in staffing problems and increased stress for many RNs.

Employment of registered nurses is expected to grow much faster than average in response to the health care needs of a growing and aging population. Driving the demand for nurses will be the greatly increased complexity of hospital care, together with the need for more registered nurses in health maintenance organizations, clinics, group medical practices, nursing homes, home health agencies, and community programs.

The decrease in nursing school enrollment, coupled with other career options available to women and the failure to attract more men to nursing has created a critical nursing shortage. If the present trend continues there will be many more nursing jobs than nurses to fill them.

## **Related Occupations**

Nurse - Midwife

Nurse Practitioner

Nurse Anesthetist

Occupational Health  
Specialist

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

Berkshire Community College  
West Street  
Pittsfield, MA 01201  
(413) 499-4660

Northern Essex Community College  
100 Elliott Street  
Haverhill, MA 01830  
(508) 374-0721



Essex Agricultural and Technical  
Institute/Collegiate Division  
Route 62  
Danvers, MA 01923  
(508) 774-0050

Massachusetts Bay Community  
College  
50 Oakland Street  
Wellesley Hills, MA 02181  
(617) 237-1100

*Four-Year (Bachelor's) Degree:*

American International College  
1000 State Street  
Springfield, MA 01109  
(413) 737-7000

Atlantic Union College  
South Lancaster, MA 01561  
(508) 365-4561

Boston College  
Lyons Hall 120  
Chestnut Hill, MA 02167  
(617) 552-3100

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2300

Curry College  
Milton, MA 02186  
(617) 333-0500

Eastern Nazarene College  
23 East Elm Avenue  
Wollaston, MA 02170  
(617) 773-2372

Quincy Junior College  
34 Coddington Street  
Quincy, MA 02169  
(617) 786-8799

Northeastern University  
(5 year program)  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2000

Salem State College  
352 Lafayette Street  
Salem, MA 01970  
(508) 745-0556

Simmons College  
300 The Fenway  
Boston, MA 02115  
(617) 738-2107

Southeastern Massachusetts  
University  
Old Westport Road  
North Dartmouth, MA 02747  
(508) 999-8605

University of Lowell  
Dugan Hall  
One University Avenue  
Lowell, MA 01854  
(508) 452-5000

Elms College  
291 Springfield Street  
Chicopee, MA 01013  
(413) 598-8351

University of Massachusetts--  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222

Fitchburg State College  
160 Pearl Street  
Fitchburg, MA 01420  
(508) 345-2151

University of Massachusetts--Boston  
Harbor Campus  
Boston, MA 02125  
(617) 929-7102

### **Where to Write for More Information:**

Communications Department  
National League for Nursing  
10 Columbus Circle  
New York, NY 10019

American Health Care Association  
1200 15th Street, N.W.  
Washington, DC 20005

American Nurses' Association  
2420 Pershing Road  
Kansas City, MO 64108

National Student Nurses' Association  
555 W. 5th Street, Room 1325  
New York, NY 10019  
(212) 581-2211

Recruitment and Placement Service  
Veteran's Administration  
810 Vermont Avenue, N.W.  
Washington, DC 20420

American Nurses' Association  
1101 14th Street, N.W.  
Suite 200  
Washington, DC 20005  
(202) 789-1800

American Hospital Association  
Division of Nursing  
840 North Lake Shore Drive  
Chicago, IL 60611

### **Secretary**

Secretaries serve both a communication and an organization function within an office. They type or use a word processors for correspondence, reports, and other documents; handle telephone calls; file, open, and route mail and other materials; and assist supervisors, managers, and executives with a variety of administrative tasks. Secretaries often work individually or in small groups, providing clerical support for one or more professionals. Some employers offer recognition for more responsible positions with titles such as "assistant to..." or administrative assistant. Secretaries can sometimes progress to supervisor or office manager; and in some fields, like

advertising, banking, and publishing, may move into professional categories and higher paying jobs after they learn the business.

The ability to be a self-starter, strong organizational skills, and attention to detail are valuable assets for secretarial work. Small offices require general all-around skills and offer a diverse range of responsibilities. Large offices may require more standardized tasks, such as straight typing or word processing. Some secretaries do bookkeeping, schedule meetings, prepare payroll or sales figures, answer correspondence and supervise part-time or general office workers.

### **Education, Training, and Hiring Requirements**

High school graduates qualify for many secretarial positions, provided they can type and have basic office skills. Secretarial programs at community and junior colleges and proprietary schools offer valuable training in business English, word processing, shorthand, and office practices and the added advantage of placement services for their graduates. Legal and medical secretarial work requires specialized post-secondary training and certification. Although word processing is becoming increasingly important, many employers will still provide the necessary training.

### **Industries That Employ Secretaries**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
822	Colleges and Universities	9.3
831	Elementary and Secondary Schools	6.4
357	Computer and Office Equipment	3.9
739	Miscellaneous Business Services	3.8
903	Local Government	3.0
367	Electronic Components and Accessories	3.0
508	Machinery, Equipment, and Supplies	2.8
602	Commercial Banks	2.7
736	Personnel Supply Services	2.5
737	Computer and Data Processing Services	2.0

### **Occupational Earnings**

Salaries vary widely, from a starting salary of \$225 to \$250, a middle range of \$300 to \$325 for typical workers, and a high of over \$425 for the most experienced and highly skilled secretaries. Higher paying opportunities occur in cities like Boston where there is a shortage of qualified applicants.



In 1985 there were 78,644 individuals employed as secretaries in the Commonwealth. Legal services and hospitals were the largest sources of employment, followed by colleges and universities, business services, and high technology industries.

### **Employment Outlook**

Opportunities for secretaries will remain plentiful into the 1990s and create a virtual "seller's market" for competent, experienced workers. This fact should improve working conditions and continue to raise the salaries and benefits that employers are willing to pay in order to fill the many vacancies created by the boom in services.

Employment of secretaries is expected to experience average growth due to office automation and changing staffing patterns. However, the administrative nature of the job -- scheduling appointments, handling clients, communicating information -- is vital to the inner workings of an organization not affected by automation and therefore a continuing need exists for qualified secretarial help.

Because this is such a large occupation, job opportunities are constantly available for those who possess the necessary skills, and those who have computer skills will increasingly be sought by employers.

### **Related Occupations**

Bookkeeper

Administrative Assistant

Office Manager

### **Institutions Providing Training in Massachusetts**

#### *Two-Year (Associate's) Degree:*

Aquinas Junior College--Milton  
303 Adams Street  
Milton, MA 02186  
(617) 696-3100

Lasell Junior College  
1844 Commonwealth Avenue  
Newton, MA 02166  
(617) 243-2000

Aquinas Junior College--Newton  
113 Walnut Park  
Newton, MA 02158  
(617) 969-4400

Marian Court Junior College  
35 Little's Point Road  
Swampscott, MA 01907  
(617) 595-6768

Bay Path Junior College  
588 Longmeadow Street  
Lowngmeadow, MA 01106  
(413) 567-0621

Massachusetts Bay Community  
College  
50 Oakland Street  
Wellesley Hills, MA 02181  
(508) 237-1100

Bay State Junior College  
122 Commonwealth Avenue  
Boston, MA 02116  
(617) 236-8000

Becker Junior College--Worcester  
61 Sever Street  
Worcester, MA 01609  
(508) 791-9241

Berkshire Community College  
West Street  
Pittsfield, MA 01201  
(413) 499-4660

Bristol Community College  
777 Elsbree Street  
Fall River, MA 02720  
(508) 678-2811

Bunker Hill Community College  
New Rutherford Avenue  
Charlestown, MA 02129  
(617) 241-8600

Cape Cod Community College  
Route 132  
West Barnstable, MA 02668  
(508) 362-2131

Chamberlayne Junior College  
128 Commonwealth Avenue  
Boston, MA 02116  
(617) 536-4500

Dean Junior College  
99 Main Street  
Franklin, MA 02038  
(508) 528-9100

Endicott College  
376 Hale Street  
Beverly, MA 01915  
(508) 927-0585

Massasoit Community College  
One Massasoit Boulevard  
Brockton, MA 02402  
(508) 588-9100

Middlesex Community College  
Springs Road  
Bedford, MA 01730  
(617) 275-8910

Mount Ida College  
777 Dedham Street  
Newton Centre, MA 02159  
(617) 969-7000

Mount Wachusett Community  
College  
Green Street  
Gardner, MA 01440  
(508) 632-6000

Newbury Junior College  
921 Boylston Street  
Boston, MA 02115  
(617) 262-9350

North Shore Community College  
3 Essex Street  
Beverly, MA 01915  
(508) 927-4850

Northern Essex Community College  
100 Elliott Street  
Haverhill, MA 01830  
(508) 374-0721

Quincy Junior College  
34 Coddington Street  
Quincy, MA 02169  
(617) 786-8799

Quinsigamond Community College  
670 West Boylston Street  
Worcester, MA 01606  
(508) 853-2300

Fisher Junior College  
118 Beacon Street  
Boston, MA 02116  
(617) 262-3240

Roxbury Community College  
625 Huntington Avenue  
Boston, MA 02115  
(617) 734-1960

Greenfield Community College  
One College Drive  
Greenfield, MA 01301  
(413) 774-3131

Springfield Technical Community  
College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

Holyoke Community College  
303 Homestead Avenue  
Holyoke, MA 01040  
(413) 538-7000

#### **Where to Write for More Information:**

Professional Secretaries'  
International  
301 East Armour Boulevard  
Kansas City, MO 64111

Association of Independent  
Colleges and Schools  
One Dupont Circle, N.W.  
Suite 350  
Washington, DC 20036

National Association of Legal  
Secretaries (International)  
3005 East Skelly Drive  
Suite 211  
Tulsa, OK 74105

#### **Stenographers:**

National Shorthand Reporters  
Association  
118 Park Street, S.E.  
Vienna, VA 22180

#### **Social Worker**

Social workers have been called "community troubleshooters." They provide counseling, referral, and advocacy for individuals and families. Social work is a dynamic field offering opportunities in a number of areas: child welfare, substance abuse, mental health, family services, developmental disabilities, health care, gerontology, elementary and secondary education, and the workplace. The job of a social worker varies according to each client population and the nature of its particular problems. In hospitals, social workers' duties range from individual counseling and group therapy to discharge planning with patients and families. In the court system, social workers offer mediation and referral services. In child and family welfare work,



they function primarily as case managers, identifying and assembling resources for families with problems. Social workers work for large institutions, local agencies, schools, and businesses. A number go into private practice.

In Massachusetts over 14,000 people are employed as social workers. About one-third work for private agencies of various kinds. Programs range from those which are clinically oriented to those which engage in community organizing. Approximately 14 percent of the social workers in Massachusetts are employed in state government, primarily by the Department of Social Services (DSS). Each of 1,700 social workers within DSS provides assessment and case management services for an average caseload of twenty families. The number and kind of social work positions in elementary and secondary schools are determined by the individual cities and towns. Some schools emphasize treatment, while others provide case management. Some towns prefer to use school psychologists rather than social workers and others, like Newton, maintain large social work departments.

### **Education, Training, and Hiring Requirements**

In January 1986, a new law went into effect in Massachusetts which requires anyone using the title of social worker (except those employed by state and local government) to pass a licensing examination. The new law provides for four levels of licensure with different titles and qualifications for each level. A licensed social worker (LSW), for example, holds either a bachelor's degree in social work or a bachelor's degree in a related field plus two years of experience. There are separate requirements for social work aides and for professionals who hold the master's in social work degree. Nine Massachusetts colleges offer accredited bachelor's degree programs in social work. Although a four-year degree is usually an appropriate credential for entry-level positions, a master's degree is usually required in clinical settings and for private practice. Commitment to service, compassion, communication, and organizational skills are important qualifications for social workers. Language skills and courses in economics, race relations, legal studies, and cross-cultural awareness are recommended in addition to the standard curriculum. Internships are a useful way to gain experience in the field and to examine personal goals, values, and motivation.

## Industries That Employ Social Workers

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
806	Hospitals	25.8
832	Individual and Family Social Services	18.8
808	Home Health Care Services	16.1
902	State Government	9.6
839	Social Services	9.6
805	Nursing and Personal Care Facilities	7.9
804	Offices of Other Health Practitioners	3.1
801	Offices and Clinics of Medical Doctors	2.2
809	Health and Allied Services	2.0
903	Local Government	1.6

### Occupational Earnings

Outside the state system, caseloads, salaries, benefits, and promotional opportunities for social workers vary widely. More stringent certification requirements and competition for talented individuals from the private sector are placing upward pressure on salaries. Social workers earn between \$14,000 and \$35,000 a year working for an agency and as much as \$70 an hour in private practice. Government positions may follow a specified career path to either supervision or administration. Supervisors in private agencies often retain responsibilities for direct care.

### Employment Outlook

This occupation is expected to expand by more than 26 percent through 1995. The increase in the number of children being born to poor families, the rising number of households headed by young single women, and continued immigration of non-English-speaking people is expected to place increased pressure on existing social services. Problems of unemployed youth, the aged, dislocated workers, and those who lack training necessary for today's jobs are expected to persist into the nineties.

Employee Assistance Programs offered in the workplace are expected to be a new source of jobs for social workers, who are particularly well-suited to provide counseling and referral to employees in areas of drug and alcohol abuse, family crisis, child care, and bereavement.

Employment growth in this field is expected to increase much faster than average in response to the needs of a growing and aging population. Employment opportunities will be best in family service agencies, home health, and hospital programs, hospitals, and private practice. In addition, with expanding health insurance

coverage and growing corporate support for employer assistance programs, more jobs will be needed.

Job prospects for social workers vary a great deal. Opportunities differ depending upon academic credentials, experience, and field of practice. Competition is keen in cities where training programs for social workers abound. In rural areas social service agencies sometimes find it difficult to attract and retain qualified staff.

### **Related Occupations**

Social Group Workers  
Medical Social Worker  
Psychiatric Social Workers  
Community Organizer

Employee Assistance  
Counselor  
Eligibility Worker (Welfare)  
Social Service Aide

### **Institutions Providing Training in Massachusetts**

#### *Four-Year (Bachelor's) Degree:*

American International College  
1000 State Street  
Springfield, MA 01109  
(413) 737-7000

Hellenic College  
50 Goddard Avenue  
Brookline, MA 02146  
(617) 731-3500

Atlantic Union College  
South Lancaster, MA 01561  
(508) 365-4561

Merrimack College  
North Andover, MA 01845  
(508) 683-7111

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2000

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2000

Bridgewater State College  
Tillinghast Hall  
Bridgewater, MA 02324  
(508) 697-1237

Salem State College  
352 Lafayette Street  
Salem, MA 01970  
(508) 745-0556

Clark University  
950 Main Street  
Worcester, MA 01610  
(508) 793-7431

Smith College  
Northampton, MA 01063  
(413) 584-0515



Eastern Nazarene College  
23 East Elm Avenue  
Wollaston, MA 02170  
(617) 773-2372

Elms College  
291 Springfield Street  
Chicopee, MA 01013  
(413) 598-8351

Emmanuel College  
400 The Fenway  
Boston, MA 02115  
(617) 277-9340

Fitchburg State College  
160 Pearl Street  
Fitchburg, MA 01420  
(508) 345-2151

Framingham State College  
120 State Street  
Framingham, MA 01701  
(508) 620-1220

Gordon College  
255 Grapevine Road  
Wenham, MA 01984  
(508) 927-2300

Hampshire College  
Amherst, MA 01002  
(413) 549-4600

Harvard and Radcliffe Colleges  
Byerly Hall  
8 Garden Street  
Cambridge, MA 02138  
(617) 495-1551

Stonehill College  
Washington Street  
North Easton, MA 02356  
(508) 238-1081

Tufts University  
Medford, MA 02155  
(617) 381-3170

University of Massachusetts--  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222

University of Massachusetts--Boston  
Harbor Campus  
Boston, MA 02125  
(617) 929-7000

Wellesley College  
Wellesley, MA 02181  
(617) 235-0320

Western New England College  
1215 Wilbraham Road  
Springfield, MA 01119  
(413) 782-3111

Westfield State College  
Western Avenue  
Westfield, MA 01085  
(413) 568-3311

Worcester State College  
486 Chandler Street  
Worcester, MA 01602  
(508) 793-8000

## **Where to Write for More Information:**

National Association of Social  
Workers  
7981 Eastern Avenue  
Silver Spring, MD 20910

Council on Social Work  
Education  
1744 R Street, N.W.  
Washington, DC 20009

The National Committee for  
Prevention of Child Abuse  
332 South Michigan Avenue  
Suite 1250  
Chicago, IL 60604

The American Humane Association  
9725 East Hampden  
Denver, CO 80231

National Center on Child Abuse  
and Neglect (NCCAN)  
Administration for Children,  
Youth, & Families (OHHS)  
P.O. Box 1182  
Washington, DC 20013

Child Welfare League  
67 Irving Place  
New York, NY 10003

American Public Welfare Association  
1125 15th Street, N.W.  
Suite 300  
Washington, DC 20005

Family Service Association  
of America  
44 East 23rd Street  
New York, NY 10010

## **Social Welfare Service Aide**

These aides are employed in a variety of human service agencies to assist social workers. They conduct intake interviews, maintain client files, transport clients to hospitals and clinics for evaluation and treatment, coordinate appointments, and provide routine support services for individuals and families.

In Massachusetts there are over 7,400 social welfare service aides. They work in child and family service programs, government agencies, health care facilities, and rehabilitation programs.

## **Education, Training, and Hiring Requirements**

Educational backgrounds among aides vary, ranging from two-year community college training programs to high school. Although salaries are low -- in many places they are less than \$5.00 per hour -- the position offers an introduction to social work and an opportunity to gain access to education, training, and progressively more responsible jobs in human services.

## Industries That Employ Social Welfare Service Aides

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
832	Individual and Family Services	75.9
809	Health and Allied Services	11.9
839	Social Services	7.9
805	Nursing and Personal Care Facilities	2.7

### Occupational Earnings

Starting pay on these jobs is about \$5.00 per hour. Experienced workers earn \$6.00 to \$7.00 per hour.

### Employment Outlook

Opportunities for social welfare service aides are expected to grow at a faster-than-average rate through 1995.

### Related Occupations

Mental Health Technician  
Social Worker

Medical Social Worker  
Psychiatric Social Worker

### Institutions Providing Training in Massachusetts

#### *Two-Year (Associate's) Degree:*

Bristol Community College  
777 Elsbree Street  
Fall River, MA 02720  
(508) 678-2811

Springfield Technical Community College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

Middlesex Community College  
Springs Road  
Bedford, MA 01730  
(617) 275-8910

### Where to Write for More Information:

National Association of Social Workers, Inc.  
7981 Eastern Avenue  
Silver Spring, MD 20910

Clearinghouse on Child Abuse and Neglect Information  
P.O. Box 1182  
Washington, DC 20013



Council on Social Work Education  
1744 R Street, N.W.  
Washington, DC 20009

## **Teller**

Tellers work in banks, savings and loan associations, and credit unions, where they cash checks, process deposits and withdrawals, accept payments for credit cards and loan accounts, and record these and other transactions on computers. Tellers sell savings bonds and travelers' checks, handle foreign currency transactions, perform light typing, and may assist with the purchase of other bank products. Tellers also play a role in maintaining account security and must verify transactions to prevent check fraud and overdrawing. Most bank tellers use an on-line computer to record transactions and monitor customer balances.

### **Education, Training, and Hiring Requirements**

Tellers generally receive formal training that often consists of both classroom experience and on-the-job exposure under the direction of a head teller or customer service representative. After a period of time determined by bank policy, tellers can apply for other positions in the firm. The teller position requires accuracy, successful interaction with customers, and attention to detail. Previous cash handling experiences and an interest in banking are generally preferred, as are the ability to operate an adding machine or calculator and a computer terminal.

Teller positions are often a port of entry into banking. As a result, a high proportion of tellers have bachelor's degrees. They are frequently liberal arts graduates who lack the finance background or experience to qualify for specialized banking occupations directly from school. Regardless of education, tellers all perform the same duties, although those with degrees can progress faster into other job titles within the bank. Employees who have performed satisfactorily, who complete required in-house or outside courses on banking and bank products, and who pass an exam can be promoted to customer service representative, and beyond that, to retail account representative. (Titles vary by institution.) Employees who lack a college degree will face limited promotional opportunities in banking.

Banks encourage promotion from within, and many offer tuition reimbursement for course work leading to a four-year degree or a graduate certificate. Courses may be taken through either the American Institute of Banking or accredited colleges and universities.

## Industries That Employ Tellers

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
602	Commercial Banks	42.7
603	Savings Institutions	33.6
612	Savings and Loan Associations	14.9
614	Personal Credit Institutions	8.4

## Occupational Earnings

Tellers average 37.5 hours in a work week. In some banks, however, the time it takes to cash out at the end of the work day is not compensated. Tellers earn low starting wages, under \$200 a week. Experienced workers earn between \$300 and \$375.

## Employment Outlook

There were over 15,000 tellers in Massachusetts in 1984. The occupation is expected to grow, but slowly, through the next decade. Some of the reasons behind slower-than-average growth are the introduction of automated teller machines and the need for banks to remain competitive by offering mail, after hours and even on-line computer services for their customers.

Fewer teller opportunities may affect the use of this occupation as a major port of entry into banking. Students who have a career interest in banking should consider earning a bachelor's degree in business or a closely related field and applying for acceptance into a management training program. Teller experience will still be important, however, because of the exposure it provides to banking services and customers. Valuable pre-graduation experience can be gained through related summer jobs, internships, and cooperative education placements completed during high school or college.

Employment growth of bank tellers is expected to increase more slowly than average and is not expected to keep pace with overall employment growth in banks and other savings and credit institutions because of the increasing use of automated teller machines and other electronic equipment.

Since this occupation provides a relatively large number of job openings, requires limited formal education and offers relatively low pay, jobs can be readily found in this occupational field.

## **Related Occupations**

Exchange Clerk

Foreign Banknote Trade

Coupon Clerk

## **Institutions Providing Training in Massachusetts**

### *Two-Year (Associate's) Degree:*

American Institute of Banking  
50 Charles River Plaza  
Boston, MA 02114  
(617) 227-1774

The New England Banking Institute  
One Lincoln Plaza  
Boston, MA 02111  
(617) 951-2350

Cape Cod Community College  
Route 132  
West Barnstable, MA 02668  
(508) 362-2131

## **Travel Agent**

Travel agents plan and coordinate travel plans for both business and vacation travelers. Agents meet with their clients to discuss travel dates, mode of transportation, financial considerations, accommodations, fares, and routes. They make travel and hotel reservations, issue tickets, compile reports, type claim forms, and submit sales reports to the transportation companies, which pay them commissions.

To minimize the complexities of traveling both at home and abroad, travel agents assist customers with required documentation (passports, visas, certificates of vaccination) and provide them with information about car rentals, traveler's checks, special events, and points of interest. Agents plan group and club tours and assemble travel packages with features of particular interest to members. While personal experience and the desire to travel are useful assets, those considering a career in the field should view it as a demanding sales occupation which requires strong oral communication and customer relations skills, familiarity with business practices and computers, and a willingness to work long hours at certain times of the year.

## **Education, Training, and Hiring Requirements**

At the present time, there are no specific degree or licensing requirements for those wishing to enter the travel agent field. Most employers, however, require formal coursework in travel administration, tourism, and related disciplines; and some prefer



candidates with a bachelor's degree. Liberal arts majors who have taken related courses in computer science, geography, foreign languages, history, and accounting should make attractive applicants. High schools, vocational schools, home study plans, adult education programs, community colleges, and some four-year institutions offer the opportunity to learn about travel services. Students can obtain useful experience by participating in travel and recreation clubs, by taking summer and part-time jobs in the industry, or by participating in more formal arrangements like internships or cooperative education.

### **Industries That Employ Travel Agents**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
472	Passenger Transportation Arrangement	99.0

### **Occupational Earnings**

Salaried agents may receive benefits like health insurance and paid vacations, while those who are self-employed work on commission. Commission rates for domestic travel arrangements average 10 percent; for international travel, 8 percent. Lower fares among competing carriers has had a negative effect on commissions recently. Government policy, international events, and fluctuations in the economy all affect travel agents' earnings.

### **Employment Outlook**

Faster-than-average growth is anticipated for this occupation as new agencies open and others expand in response to market conditions. As service sector industries continue to grow and individual and corporate incomes rise, more people and businesses will require travel services. Analysts include travel agents among the twenty fastest growing occupations in the Commonwealth.

Employment of travel agents is expected to grow faster than average as new travel agencies open and existing agencies expand to meet the large increases expected in both vacation and business related travel. Also, with rising incomes and increasing emphasis on leisure-time activities, more people are expected to travel -- and to do so more frequently -- than in the past.

**Related Occupations**

Reservation Agent, Transportation Clerk (airlines, railroads)

Passenger Rate Clerk (bus companies)

Travel Counselor (automobile clubs)

**Institutions Providing Training in Massachusetts***Four-Year (Bachelor's) Degree:*

University of Massachusetts--Amherst

Amherst, MA 01003

(413) 545-0222

*Two-Year (Associate's) Degree:*

Bay Path Junior College

588 Longmeadow Street

Longmeadow, MA 01106

(413) 567-0621

Bay State Junior College

122 Commonwealth Avenue

Boston, MA 02116

(617) 236-8000

Becker Junior College--Leicester

Leicester, MA 01524

(508) 892-8122

Endicott College

376 Hale Street

Beverly, MA 01915

(508) 927-0585

Fisher Junior College

118 Beacon Street

Boston, MA 02116

(617) 262-3240

Lasell Junior College

Newton, MA 02166

(617) 243-2225

Marian Court Junior College

Swampscott, MA 01907

(617) 595-6768

Massachusetts Bay Community  
College

50 Oakland Street

Wellesley Hills, MA 02181

(617) 237-1100

Mount Ida College

Newton Centre, MA 02159

(617) 969-7000

Newbury Junior College

921 Boylston Street

Boston, MA 02115

(617) 262-9350

Quinsigamond Community College

670 West Boylston Street

Worcester, MA 01606

(508) 853-2300

## **Where to Write for More Information:**

American Society of Travel Agents  
4400 MacArthur Boulevard  
Washington, DC 20007

## **Truck Driver**

Jobs in this occupation are quite diverse. Truck drivers transport commodities from one location to another; those commodities range from furs to gravel and from oil to milk. There are drivers who drive across the country, within a particular region, and within a particular city. Methods of payment can be based on the hours worked, the miles driven, the number of deliveries made, or a percentage of the value of the load. Drivers may simply pick up and drop off trailers or may be required to load and unload their trucks. The exact duties drivers must perform vary from company to company and depend on the type of driving (long haul or local delivery).

There are, however, some duties that all truck drivers must perform. For distance, they must complete some type of paperwork. Long haul drivers and regional drivers are required by law to maintain a travel log, and all drivers must collect invoices. In the log, drivers must enter number of miles traveled, the type of commodity being carried, and their hours behind the wheel. They must also collect invoices when they pick up a load, drop off (or deliver) the load, and stop for fuel. Some drivers, especially delivery drivers, may have to collect payment and write receipts when they make deliveries. In addition, all drivers perform simple maintenance on their trucks.

Truck drivers may be required to perform various other duties depending on the companies they work for. For example, a company may only require a truck driver to pick up a loaded trailer, drive it to a destination, and drop the trailer off. Another company may require the driver to help load and unload the trailer.

The amount of time spent behind the wheel also varies. Long haul drivers can spend weeks at a time on the road, with the vast majority of hours spent in the truck. It should be noted here that federal law limits a truck driver to 70 hours of driving per week. If two people are driving the truck and the truck has a sleeping compartment, a driver can spend all but 28 hours of a week in the truck.

Local delivery drivers spend less time on the road than long haul drivers, as well as a lower percentage of time actually in the truck. The exact amount of time a delivery driver spends on the road depends on the method of payment and the company the driver works for.



Some companies pay an hourly wage and drivers may be required to work only 40 hours per week. Other companies pay drivers a certain amount per delivery and require a set number of deliveries. In this case, the number of hours a driver works depends on how many deliveries are required and how quickly they can be made.

A driver can earn more money in one of three ways: by working more hours, by becoming more efficient (spending less time at each delivery location and using better judgment when choosing a route), or by working for a company that pays a higher wage. Such companies are usually larger and more prestigious; many drivers want to work for them; and therefore these companies are able to choose the better drivers.

What makes a good truck driver? Those qualities are much the same as in any other profession. They must have a good attitude, want to do a good job, perform tasks efficiently--and have a good driving record.

### **Education, Training, and Hiring Requirements**

According to the admissions director of a large truck drivers' training school whose graduates are recruited by major trucking companies and transportation departments from across the country, recruiters look at the professional qualifications, professional characteristics and record, and personality of an applicant.

"Professional qualifications" means having the right driver's license. A class one license enables a person to drive a semi tractor trailer rig. The class two license is for those wanting to drive heavy trucks (over 18,000 pounds).

The procedure for both licenses is the same, a written test and a driving test. The written test covers the rules and regulations of interstate driving, which differ slightly for tractor trailers and heavy trucks. The driving test take place in a tractor trailer; the driving test for a class two license, in a heavy truck.

Recruiters are attracted to graduates with clean driving records, good attitudes, and good attendance. They also like to see good recommendations from the instructors.

Some companies require their drivers to be bonded but will hire those who aren't as long as they are bondable. Jobs that require the driver to be bonded usually involve a very expensive cargo such as fur coats.

Recruiters also want to know what type of personality an applicant has. Good truck drivers like to work on their own with little or no supervision and they like to drive. They are also independent. Long haul drivers should possess these characteristics in even greater amounts than local delivery drivers.

The highest rung in a truck driver's career ladder is to become an owner-operator. Because of the start-up costs, this is not an option for everyone. But for those with an entrepreneurial flair, "owning your own rig" is the ultimate goal.

## Industries That Employ Truck Drivers

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
423	Terminals	6.3
421	Trucking, Local and Long Distance	3.7
144	Sand and Gravel	3.4

## Occupational Earnings

Heavy Truck Drivers earn between \$10.00 and \$20.00 per hour. Route and delivery workers earn \$6.00 to \$9.00 per hour.

## Employment Outlook

Average growth for employment of truck drivers is expected as the economy grows and the amount of freight carried by trucks increases. Growth of local and long distance truck driver employment should outweigh the decline in driver-sales worker jobs.

This occupation has among the largest number of job openings each year. Since driver earnings are high and no formal training is required, applicants can expect to face competition for available jobs.

## Related Occupations

Bus Driver

Route Driver

Long Distance Truck Driver

## Institutions Providing Training in Massachusetts

New England Tractor Trailer  
Training School  
542 East Squantum Street  
Quincy, MA 02171  
(617) 328-0250

Andover Tractor Trailer  
Training School  
55 Hampshire Road  
Methuen, MA 01844  
(508) 689-3400

Allied Tractor Trailer  
Training School  
295 Union Street  
Walpole, MA 02032  
(508) 668-6604

## **Typesetter or Compositor**

These pre-press workers prepare text and graphics for printing in the composing rooms of newspapers, commercial printers, and specialized trade shops. Typesetters convert the writers' text into a medium for printing, usually by typing on a computer terminal linked to a phototypesetter. Following directions from a designer or complying with a standard format, typesetters use the keyboard to select type style, size, and column width. Compositors arrange columns of type, pictures, and graphics according to design specification.

In many establishments, this work is still performed physically: phototypesetting machines generate columns of type and compositors cut and paste these on boards with photos and graphics. In the more technologically advanced newspapers and print shops, however, composing is all done electronically, on an oversized computer screen. In these settings, the jobs of typesetter and compositor have merged into one occupation. Half of all typesetters and compositors work in newspapers; the rest work in commercial print shops or trade shops.

### **Education, Training, and Hiring Requirements**

Technological change is occurring rapidly in the pre-press area; there is much variety now in the kind of machines that typesetters work with and the levels of skill required. Some typesetters are essentially data entry workers, but they work on composing machines instead of computers. These workers need to have fast and accurate typing skills. Other typesetters work with text that has already been entered into a computer system by writers or reporters. These typesetters electronically manipulate the text to give it the right typeface, spacing, size, and column shape. There are highly skilled typesetters, also called typographers, who typeset complex, one-time-only jobs. These workers need to know how to operate phototypesetting machines like other typesetters, but also need considerable background in how to choose and fit type.

Compositors who are doing physical paste up work must have steady hands and a keen eye for detail. Those who work on electronic pagination machines must have



skills similar to those of typesetters. Both kinds of composing work can be learned on the job. Employers prefer to hire and train people who already have had some graphic arts background, either in a vocational high school or post-secondary technical school.

### **Industries That Employ Typesetter or Compositor**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
271	Newspapers	51.0
275	Commercial Printing	20.1
278	Blankbooks and Bookbinding	10.0

### **Occupational Earnings**

Typesetters' wages vary considerably with experience and the complexity of the job. Typesetters who key in type for standardized jobs earn approximately \$300 per week; compositors' salaries are in about the same range. Experienced typesetters, however, who set complex jobs can earn up to \$17.00 per hour. As with other jobs in the printing and publishing industry, composing room work can be very time-sensitive; at deadline times, the pressure to work quickly is strong. Overtime is also quite common. All newspapers and some commercial printers have night as well as day shifts.

### **Employment Outlook**

The Department of Employment and Training has projected a 7 percent decline in typesetters' and compositors' jobs between 1984 and 1995. In commercial printing, however, the largest sector in the industry, growth in the volume of production may continue to offset productivity improvements; the result may be stable; or perhaps even growing, employment opportunities. Newspaper firms, on the other hand, are likely to reduce employment of typesetters gradually, through attrition and early retirement incentives.

Employment of typesetters and compositors is expected to grow more slowly than average despite expansion of the printing industry. Productivity gains associated with new labor-saving technologies are the principal reason. Fewer workers will be needed as computerized equipment simplifies or eliminates many of the time-consuming tasks traditionally performed by compositors and typesetters. Furthermore, the number of jobs would sink even further were it not for the prospect of greatly increased demand for printed materials in the years ahead.

Job prospects in this field vary by industry and changes in technology have shifted many employment opportunities away from the traditional printing shop into

advertising agencies or public relations departments. Therefore, the best opportunities will be for experienced workers and competition for jobs is expected to intensify through the year 2000.

**Related Occupations**

Printer

Lithographer

**Institutions Providing Training in Massachusetts**

*Two-Year (Associate's) Degree:*

Springfield Technical Community  
College  
One Armory Square  
Springfield, MA 01105  
(413) 781-7822

*Vocational Education Programs:*

See Appendix C

**Where to Write for Further Information:**

Educational Council of the  
Graphic Arts Industry  
4615 Forbes Avenue  
Pittsburgh, PA 15213

Printing Industries of America, Inc.  
1730 N. Lynn Street  
Arlington, VA 22209

International Typographical Union  
P.O. Box 157  
Colorado Springs, CO 80901

Graphic Communications  
International Union  
1900 L Street, N.W.  
Washington, DC 20036

## Vocational Counselor

Vocational counselors work in a variety of settings, including schools, colleges and universities, job training and placement, government, social services, and mental health. These counselors help students and other clients identify and carry out occupational and educational objectives. Vocational counselors work with individuals to assess their skills and interests, develop a career plan, and secure employment based on those skills and plans. Counselors frequently work with groups as well, offering workshops in resume design, interview techniques, and job search skills. Many vocational and career counseling programs have placement components which involve counselors in outreach and job development activities with local industries.

Vocational counselors need to be knowledgeable in four primary areas: assessment, labor market information, job search, and placement. They use tests, personal interviews, academic transcripts, and questionnaires to appraise their clients' interests, aptitudes, abilities, and personal characteristics and to determine possible career directions. Familiarity with labor market information helps counselors introduce their clients to the occupations and industries which require their educational background, skills, and abilities. In presenting job search techniques, vocational counselors help equip their clients with the means to put career plans into action. Finally, familiarity with current job openings makes it possible for counselors to place clients in appropriate employment opportunities.

In the education field, vocational counselors work in vocational high schools and in cooperative education, placement, and career development programs in postsecondary institutions. In government and social services, vocational counselors work in job readiness programs for teens, in training programs for displaced and disadvantaged workers, and in job matching services operated by the state. Mental health agencies employ vocational counselors in rehabilitation and outplacement programs.

Each kind of industry or service program has its own career ladder or promotional path. Outside state government and large institutional settings, vocational guidance offices tend to be small, employing only one or two professionals. In 1984 there were 4,530 vocational and educational counselors in the state. The number of these opportunities in Massachusetts is enhanced by the large number of colleges and universities in the Commonwealth and also by the current emphasis of state government on improving the match between workers and job opportunities.



## Education, Training, and Hiring Requirements

Regardless of setting, counselors help people with their problems. Many professionals find it difficult to separate work-related issues from the other personal concerns of a client. Recognizing and dealing effectively with a variety of counseling problems requires a background in counseling or psychology. The more clinically-oriented the setting, the more likely it is that counseling opportunities will require a master's degree.

Beyond an understanding of the individual, vocational counselors must be familiar with the institutions where people work. Industry experience, awareness of the labor market for the target population, and courses which provide information about the purpose and organization of work -- personnel administration, organizational development, the sociology of work, economics, labor studies, business management -- are important prerequisites for vocational counseling. Education and training requirements for school guidance counselors at the elementary and secondary levels are established by the state. Where counselors are responsible for client and industry outreach, an outgoing personality and strong verbal communication and presentation skills are valuable assets.

Individuals who do not have either a four-year or advanced degree can nevertheless learn about the field and gain useful experience by seeking out opportunities in clerical or technical support areas. Career planning and placement offices at colleges and universities, for example, need secretaries who have an interest in helping clients and learning more about vocational and career guidance. These programs frequently house career libraries and employ technicians to assist job seekers with reference materials, score aptitude tests, maintain files, and operate audio visual equipment.

## Industries That Employ Vocational Counselors

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
831	Elementary and Secondary Schools	55.7
902	State Government	20.2
822	Colleges and Universities	8.0
833	Job Training and Related Services	6.4
839	Social Services	3.1
836	Residential Care	3.0
903	Local Government	1.5

### **Occupational Earnings**

Salaries in social services and education are lower and educational credential requirements are sometimes higher than those in private industry. At present entry-level salaries in vocational counseling often start in the low twenties.

### **Employment Outlook**

Opportunities for vocational counselors are expected to increase moderately through 1995. Educational institutions will continue to be the best source of jobs in this occupation.

The outlook for vocational counselors is for slow to average growth depending on where one works. Those who work in schools, the largest specialty area, will have a slower than average employment growth in line with projected enrollments. Those who work for state and local government will see an average increase in this occupation.

### **Related Occupations**

Counselor, Adviser

Job Developer

Guidance Counselor

### **Institutions Providing Training in Massachusetts**

#### ***Four-Year (Bachelor's) Degree:***

University of Massachusetts/  
Boston  
Harbor Campus  
Boston, MA 02125  
(617) 929-8600  
(Master's Degree Program)

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2000  
(Master's Degree Program)

#### **Where to Write for More Information:**

American Association for  
Counseling and Development  
5999 Stevenson Avenue  
Alexandria, VA 22304

Council on Rehabilitation Education  
185 North Wabash Street  
Room 1617  
Chicago, IL 60601

Council for Accreditation of  
Counseling and Related  
Educational Programs  
5999 Stevenson Avenue  
Alexandria, VA 22304

Division of Resource Development  
Rehabilitation Services  
Administration  
U.S. Department of Education  
330 C Street, S.W.  
Washington, DC 20202

National Board for Certified  
Counselors  
5999 Stevenson Avenue  
Alexandria, VA 22304

Commission on Rehabilitation  
Counselor Certification  
1156 Shure Drive  
Arlington Heights, IL 60004

National Council on Rehabilitation  
Education  
c/o Maddux O'Malley, Inc.  
2921 Ermine Way  
Farmers Branch, TX 75234

National Academy of Certified  
Clinical Mental Health Counselors  
5999 Stevenson Avenue  
Alexandria, VA 22304

## **Vocational Technical Education Teacher**

Vocational technical education prepares students to enter trade, technical, or occupational fields requiring special or technical skills. Training programs are offered in secondary schools, community colleges, and proprietary schools. Programs consist of classroom and "hands-on" instruction and often include work experience and job readiness activities as well as vocational guidance.

Vocational education programs for school-age populations range from elective courses to comprehensive degree programs. Traditionally, vocational education programs have focused on the development of auto mechanics, carpentry, agricultural production, dental hygiene, and typing. However, advances in technology and expansion in the service sector have led to the creation of sophisticated new training programs in finance, computing, hospitality, architecture, and micro electronics. Though not covered in detail here, evening enrichment programs for adults offered by continuing education departments of schools and colleges are also considered vocational education. Programs for adults range from displaced homemaker training to self-improvement workshops on a variety of topics.

Teaching opportunities in vocational education vary widely. They range from full-time, state-approved positions in high schools to part-time jobs in adult and continuing education programs in local colleges. In Massachusetts, the Department of Education oversees an extensive and comprehensive system consisting of community college programs, regional voc-tech schools, county voc-agricultural schools, city and



town vocational schools, and vocational courses in traditional academic schools. Using a combination of federal, state, and local funds, the state vocational education system prepares students for useful careers, alleviates skill shortages, expands apprenticeships, upgrades the skills of adult learners, fosters self-employment, and forges working relationships between the private sector and education.

The Department of Education Division of Occupational Education regulates vocational education in the state. The Division implements state and federal vocational education laws; provides technical assistance to school districts and community colleges; and establishes standard qualifications for teachers, supervisors, and guidance personnel in vocational programs.

In Massachusetts, 225 schools and community colleges offer vocational education. About two-thirds of these institutions are located in the eastern part of the state. They offer over 125 occupational programs including vocational agriculture; distributive education; health, office, and technical occupations; occupational preparation for homemaking; trade and industry; and industrial arts. According to figures published by the Department of Education, there were 9,450 full and part-time vocational education instructors in the Commonwealth in 1985. Most of the full-time opportunities occurred at the secondary school level, while college and adult education programs employed more instructors on a part-time basis. Enrollments in all programs exceeded 300,000 students.

Working conditions, salary, promotional opportunities, and education and training requirements for vocational education teachers in Massachusetts vary according to discipline. Teachers work in either classrooms or lab environments, depending upon what they teach. Full-time teachers work an average of forty hours per week and, like their colleagues in academic areas, do most of their preparation outside regular working hours.

### **Education, Training, and Hiring Requirements**

Hiring in vocational education is done at the local school level. Recruitment is informal and is conducted through newspaper ads, placement offices at colleges and universities that offer teacher training, and the local business and technical community. Substitute teachers, who apply directly to the school, are often the first to hear about full-time openings.

Credential requirements for both teaching and administrative positions in vocational education are established by the state and implemented by the local school district. A listing of specific requirements may be obtained from the state Division of Occupational Education. In general, instructional personnel in the technical, construction, and industrial manufacturing programs must have *either* a minimum of a

high school degree and six years of recent full-time work experience in the occupation or a bachelor's degree and three years of work experience. (A master's degree in the field can substitute for four years' experience.) Candidates in all other occupational areas are required to have a bachelor's degree in the field and a minimum of three years experience. (A master's degree can be substituted for one of the three years.)

Teaching certification is an attractive credential although it is not required. Where license is a requirement for the occupation being taught, instructors must hold a current license. *All* candidates must pass a competency exam administered by the Division of Occupational Education. In order to keep their jobs, instructors are expected to take courses or to work in their field for a specified amount of time every two years.

Vocational education teachers can progress to either supervisory or administrative positions with a combination of a bachelor's or master's degree in their field and a designated number of years in instruction. Because vocational education places a premium on professional and technical expertise, managerial or supervisory experience in industry can satisfy a portion of the instructional requirement. The career path for teachers ranges from instructor, to coordinator or supervisor, to department head or director, to superintendent.

Two of the most pressing issues in vocational education today are keeping up with changing technologies and attracting and retaining strong teaching staffs.

### **Industries That Employ Vocational Education Teachers**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
821	Elementary and Secondary Schools	29.1
829	Schools and Educational Services	12.6
824	Vocational Schools	10.9
833	Job Training and Related Services	9.4
832	Individual and Family Services	8.0
822	Colleges and Universities	7.1
839	Social Services	3.8
806	Hospitals	3.7
864	Civic and Social Associations	3.7
902	State Government	3.3
901	Federal Government	3.2

## **Occupational Earnings**

Teacher salaries range from \$18,000 to \$40,000. They work 10 months on contract. On average, experienced vocational education teachers earn around \$3,000 a year more than academic teachers. Even with the higher salaries, vocational education teachers earn about 40 percent less than similarly skilled practitioners in private industry.

In addition to their teaching duties, vocational education teachers have a number of added responsibilities. They work with industry advisory committees on the content and quality of the curriculum, keep up with technological and other developments in their fields, may supervise student work placements off campus, and remain abreast of local labor market conditions and the demand for their students in the economy. Vocational education teachers spend a great deal of time engaged in counseling and motivational activities. Program directors tell us that it is not enough for vocational educators to be competent in a technical field. They need to be ready to work as a team with school psychologists, guidance counselors, and other professionals to address the needs of the whole student. Still, vocational education teachers seem to exhibit less "burn out" than other teachers. Their ties to the local business community, the flexibility afforded by travel to work sites, and students' recognition of the connections between school and work are sources of job satisfaction for many "voc-ed" teachers.

## **Employment Outlook**

At the present time, vocational education teachers are needed to help address worker shortages in certain occupational areas. Demand continues to rise because relatively low salaries (compared to industry salaries) make it hard for school systems to compete for qualified instructors.

It is difficult to predict how many vocational education teachers will be needed in the future. Factors negatively influencing demand include the shift from a manufacturing-based economy to one based on services and the decline in the number of skilled tradespersons traditionally employed by manufacturing. On the other hand, service sector growth and change may give rise to a range of new occupations and training needs. The pace and direction of technological change will undoubtedly affect occupations in fields ranging from micro electronics to clerical work and business computing. By association, these developments will have an effect on vocational training programs. Outmoded curricula will be eliminated and, depending upon industry skill requirements, new ones will take their place.

Another factor determining the number of jobs will be the number of youths entering secondary schools and community colleges in the early 1990s. If declines



among this age group are as dramatic as predicted, fewer teachers may be needed unless, at the same time, new programs for adult learners expand to meet capacity.

Finally, as we learned from Proposition 2 1/2, changes in funding priorities at the state, federal, and local levels can have a profound effect on the number of jobs available for teachers. Those considering careers in vocational education should take economic and technological change, demographic trends, and legislative events into account in the planning process.

Employment of vocational education teachers is expected to experience average growth as the demand for vocational education programs continues to rise. Vocational education teachers will be needed to train young adults for entry level jobs and to upgrade the skills of experienced workers who want to advance or switch fields or whose jobs have been eliminated due to changing technology or business reorganization.

Also contributing to the demand is the increased participation by adults in part-time education due to the growing emphasis on leisure time and self-improvement activities. As it becomes more difficult to get a good job without basic skills, the demand for adult basic education programs should increase.

Opportunities for vocational education teachers will be best in fields such as computer technology, automotive mechanics, and medical technology, which offer very attractive job opportunities outside of teaching.

### **Related Occupations**

Vocational Education Counselor  
Correspondence School Instructor

Adult Education Teacher

### **Institutions Providing Training in Massachusetts**

#### *Four-Year (Bachelor's) Degree:*

Fitchburg State College  
160 Pearl Street  
Fitchburg, MA 01420  
(617) 345-2141

Westfield State College  
Western Avenue  
Westfield, MA 01085  
(413) 568-3311

### **Where to Write for More Information:**

Division of Occupational Education  
Massachusetts Department of Education  
1385 Hancock Street  
Quincy, MA 02169

American Vocational Association  
14 W. King Street  
Arlington, VA 22201

## Welder or Cutter

Welding is the most common way of permanently joining metal parts. Heat is used to join the metal pieces by melting the parts and fusing them together, forming a permanent bond. In many cases a filler, called an electrode or welding rod, is melted and added to the weld to help strengthen the bond. Welding is used in the manufacture and repair of ships, cars, refrigerators, machinery, and thousands of other products as well as in the construction and repair of buildings, bridges, and roads.

There are three different types of welding: gas, electrical arc, and resistance. Electrical arc, the most common, makes use of electricity to produce the heat needed to melt and join metal parts together. A cable from a power supply is attached to one of the metal pieces to be welded. Heat is generated by an arc as the welder touches the metal with an electrode attached to a second cable from the power supply. As the welder runs the electrode along the metal at the point to be welded, an arc is created which produces heat. If the distance between the electrode and the point where the first cable is attached to the metal is correct, the heat produced will be hot enough to melt and join the two metal pieces together. The electrode also melts and fills the weld to strengthen the bond.

Resistance welding is similar to electrical arc in that electricity is used to produce the heat. Rather than making use of an electrode, the welder attaches an electrical cable to each piece of metal to be welded. Heat is produced when the two metal pieces come in contact. The heat melts the metal at the contact point and joins them together.

The third method of welding, gas welding, employs a mixture of oxygen and gas (usually acetylene) to produce a flame hot enough to melt the metal. Gas and oxygen flowing through hoses from tanks to a welding tip are ignited to produce a very high temperature flame. The welder applies the flame directly to the metal pieces. The flame melts the metal and joins the parts together. A welding rod is also melted and added to the weld to fill and strengthen it. Gas welding is generally used when welders do not have easy access to electricity, such as in the repair of metal pipes in remote locations.

After welders have joined the metal together, they may use manual or automatic chippers, files, grinders, and sanders to remove excess filler and smooth the joint.

The cutting of metal is a very similar process. The same equipment is used and the same knowledge is required, except that metal cutting involves a higher voltage or flame temperature. Most welders are able to do both welding and cutting.



In many production processes where the work is repetitive, a welding machine is used. The machine operator places the metal parts on a fixture on the machine and presses a button. The machine automatically clamps the parts to the fixture, positions them appropriately, and welds them together. Little welding skill is required to operate such a machine, but the operators do need an understanding of machinery and must know how to adjust the machine according to written specifications.

Technological advances are having a great effect on the field of welding. Welding machines are increasingly being replaced by robotics, and welding techniques are changing to incorporate laser beam, electron beam, and inertia welding techniques. These advances, which are resulting in faster, more efficient methods of welding, are expected to be used more and more as they become less expensive.

Changes in metal technology are resulting in the constant introduction of new materials with different characteristics. Welders must take these characteristics into consideration when deciding on the temperature or voltage and type of electrode to use. If welders are to prevent their skills from becoming obsolete, they must keep abreast of all these changes in metal technology and welding methods.

Welding can be dirty, strenuous, and very hazardous. Welding equipment is very heavy and often the metal pieces to be welded are heavy also. Workers come in contact with rust, grease, and dirt; some metals give off toxic gases or fumes. As a result, welders must wear protective clothing, boots, gloves, goggles, and helmets with visors to prevent burns and eye injuries. Welders may be isolated for long intervals in booths constructed to contain sparks and glare, or they may work outdoors in all sorts of weather. Sometimes they must bend, stretch, or force their bodies into awkward positions for long periods of time.

### **Education, Training, and Hiring Requirements**

On-the-job training is the most likely route to a job as a welder. Helpers start by carrying equipment, lifting and holding metal pieces, and cleaning up the work area. Within a few weeks, they learn to read blueprints, measure and position metal, and perform simple welding and cutting techniques. Eventually they become fully skilled welders.

Employers prefer physically fit individuals with a high school diploma or its equivalent. High school, vocational-technical, or other trade school courses in metalworking, shop, drafting, blueprint reading, and math are excellent preparation for work as a welder. Welders need good eyesight, manual dexterity, and hand-eye coordination. They should have the ability to concentrate on detailed work for long periods of time and must be able to bend, stoop, and work in awkward positions.



Many employers, in conjunction with local trade unions, provide apprenticeship programs which supplement on-the-job training with classroom training. Apprenticeships in welding generally last 36 months, and the apprentice is paid a wage during that time. At the end of the training, the apprentice is given journeyman status.

After gaining experience as a welder and participating in advanced classroom training, a journeyman welder may be elevated to master welder. Some welders choose self-employment and start their own welding firms.

### **Industries That Employ Welders and Cutters**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
371	Motor Vehicles and Equipment	11.5
769	Miscellaneous Repair Shops	9.8
373	Ship and Boat Building and Repairing	8.5
372	Aircraft and Parts	6.9
179	Miscellaneous Special Trade Contractors	4.9
344	Fabricated Structural Metal Products	4.2
382	Measuring and Controlling Devices	3.6
335	Nonferrous Rolling and Drawing	3.5
891	Engineering and Architectural Services	3.4
507	Hardware, Plumbing and Heating Equipment	2.3

### **Occupational Earnings**

Welders and cutters generally are paid on an hourly basis. Starting salaries usually range from \$5.00 to \$7.00 per hour. More experienced welders earn around \$9.00, but a welder making \$15.00 per hour is not unheard of. The typical hourly wage is between \$6.75 and \$9.25.

### **Employment Outlook**

Employment of welders and cutters is expected to grow as increases in population and income stimulate demand for buildings, heavy machinery, appliances, and thousands of other products that welders help make. Major construction projects in and around the city of Boston (the third harbor tunnel and depression of the central artery) are also expected to boost the employment of welders and cutters.

Some of the anticipated growth in the employment of welders and cutters is expected to be offset by losses in the employment of welding machine operators. Robotics and other technological advances have already eliminated many welding machine operators' jobs. As more and more manufacturing plants modernize, opportunities for welding machine operators will continue to decline.

**Related Occupations**

Machinist

Machine-Tool Operators

Tool and Die Setter .

Millwright

Sheetmetal Worker

Boilermaker

Metal Sculptor

**Institutions Providing Training in Massachusetts***Two-Year (Associate's) Degree:*

Roxbury Community College

625 Huntington Avenue

Boston, MA 02115

(617) 734-1960

*Vocational Education Programs:*

See Appendix D

**Where to Write for More Information:**

The American Welding Society

550 LeJeune Road, N.W.

Miami, FL 33126

**Wholesale Trade Sales Worker**

Wholesale trade involves the sale of goods from the factory to retailers, industrial and commercial firms, and institutions such as schools and hospitals where they may be consumed, sold, or used in the production of other goods. A wholesale drug salesperson, for example, may sell several brands of drugs, soaps, and cosmetics to local pharmacies; and a wholesale papergoods worker may sell a variety of medical and nonmedical paper supplies to hospitals. Wholesale salespersons identify new accounts and service existing ones by taking orders, coordinating promotional activities and advertising efforts, and facilitating the delivery of goods to the buyers. Salespersons may show samples, pictures, or catalogs which describe items that their company stocks; demonstrate to customers how products can save money and improve productivity; and offer prompt, dependable service so buyers will become regular customers.

The nature of the sales position varies with the type of sales involved and the products or services sold. While most wholesale salespeople limit their efforts either geographically or functionally (by product), the job usually requires keeping records of sales, forwarding orders to the wholesale firms, preparing reports and expense accounts, planning work schedules, drawing up lists of prospects, making appointments, and studying literature describing the products. Some wholesalers eventually assume positions as buyers, sales service promoters, manufacturing sales workers, or field contact technicians and demonstrators; some become supervisors or managers.

The position requires a positive and outgoing personality, good communication skills, the willingness to take risks and face rejection, and the capacity and desire to learn about a special product or subject area. Most wholesalers work out of the home offices of their firms, which are usually located in large cities. A wholesaler's territory may consist of a small section of a city with many retail stores and industrial users, or a less populated region covering half a state or more. Travel and irregular hours are not unusual since work is conducted during regular business hours, with traveling occurring during the nights or weekends to meet schedules. Most salespersons, however, are seldom away from home for more than a few days at a time.

#### **Education, Training, and Hiring Requirements**

The training that is required for wholesalers varies by product line and market. Technical products, for example, may require a college degree with a technical background in engineering, chemistry, or biology. Nontechnical products such as food, however, require sales ability and familiarity with manufacturers and brands more than knowledge about the product itself. High school graduates may begin with nonselling jobs or as sales trainees in nonselling jobs, such as in the stockroom or shipping department, before being assigned to an "inside" sales job taking telephone orders. It may take two or more years before trainees work directly with "outside" sales workers on visits to customers. While some large firms offer formal training programs, most individuals learn on the job by observing experienced workers and gradually assuming more responsible work.



## **Industries That Employ Wholesale Trade Sales Workers**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
508	Machinery, Equipment and Supplies	20.1
514	Grocery and Related Products	12.6
513	Apparel, Piece Goods and Notions	8.3
506	Electrical Goods	7.2
519	Miscellaneous Nondurable Goods	7.1
507	Hardware Plumbing and Heating Equipment	5.8

In 1985 there were 6,823 wholesalers in Massachusetts. The largest areas for employment were in the sale of machinery, equipment, and supplies, followed by groceries and related products and apparel, piece goods, and notions.

### **Occupational Earnings**

Salaries range from \$320 to \$625 a week and average about \$450. A person's initiative greatly influences earnings since most wholesalers work either on salary plus commission or a straight commission basis.

### **Employment Outlook**

Opportunities for wholesalers are expected to grow faster than the average through the mid-1990s as the volume and kind of goods produced are expanding. Openings occur as experienced workers transfer to other jobs or retire. The number of replacements needed will remain large because the occupation employs many people and the turnover is very high.

The number of wholesale trade sales workers is expected to grow faster than average as the volume and kind of goods produced in the economy expand. Most businesses and institutions that require a wide variety of products for their own use and for eventual resale will continue to purchase these products from wholesale-distributors. Also, instead of expanding their own sales forces, manufacturers are finding it more cost effective to rely on wholesalers and on independent sales representatives, who sell manufacturer's products solely on a commission basis. As wholesalers expand their product lines and the number of sales districts, the demand for capable sales workers will rise, creating jobs for those with sales ability.

**Related Occupations**

Buyer  
Sales Service Promoter  
Manufacturing Sales Worker

Field Contact Technician  
Demonstrator

**Institutions Providing Training in Massachusetts***Two-Year (Associate's) Degree:*

Bay State Junior College  
122 Commonwealth Avenue  
College Boston, MA  
(617) 236-8000

Bentley College  
School of Continuing and  
Professional Studies  
311 Beaver Street  
Waltham, MA  
(617) 891-2135

Bunker Hill Community College  
Rutherford Avenue  
Charlestown, MA  
(617) 241-8600

Chamberlayne Junior College  
90 Marlborough Street  
Boston, MA 02115  
(617) 536-0682

Fisher Junior College  
Evening Division and Weekend  
108 Beacon Street  
Boston, MA  
(617) 536-4647

Harvard University  
Center for Lifelong Learning  
Massachusetts Avenue  
Cambridge, MA  
(617) 495-4973

John Robert Powers School  
9 Newbury Street  
Boston, MA  
(617) 267-8781

Lasell Junior College  
The Womens Center for  
Continuing Education  
1844 Commonwealth Avenue  
Newton, MA  
(617) 243-2146

**Writer/Editor (Including Technical Writer)**

Writers and editors use the printed word to communicate information about events, people, services, and products to an audience. They are employed in advertising, publishing, education, film, public relations (also see Public Relations Specialist), education, sports, business, retail sales, and industry. Among a writer's most important tools are language, curiosity, clarity, synthesis, and style. Among a writer's most important assets is the ability to communicate information effectively and interestingly to intelligent but uninformed readers.

In Massachusetts, opportunities for writers and editors span over a dozen industries. There are approximately 5,300 people employed as writers and editors in the state. One-third of the jobs occur in high technology. Publishing, specifically book and newspaper publishing, accounts for over 25 percent; business services and advertising employ an additional 11 percent of all workers in these occupations. Each industry has its own training requirements, hiring standards, salary structure, and promotional ladder. This makes it difficult for prospective writers and editors to learn about the range of opportunities. One apparent and frustrating contradiction is that in order to become a writer, you must already be a writer. Entry-level positions are often difficult to find and usually require evidence of writing ability.

In general, writers are responsible for originating written material while editors assign, select, and prepare material for publication. For this reason, it is often easier for recent graduates to find work as a proofreader or copy editor than as a staff writer or reporter. Copy editors work in the editorial departments of publishing companies, newspapers, and magazines. They correct grammar and stylistic errors, rewrite copy, verify facts and dates, confer with authors about changes, and proofread text before final publication. Copy editors come from a variety of educational backgrounds and are required to have a thorough knowledge of spelling, grammar, and punctuation. Once they gain experience, proofreaders and copy editors can move into writing or obtain more challenging positions within editing, such as associate editor or editor.

Reporters gather information and write stories for publication. They frequently have a bachelor's degree and often begin their careers as correspondents or "stringers" with small local newspapers. Salaries for this kind of work are generally low. It is not unusual, for example, for reporters to be paid by the article or by the number of lines the newspaper decides to print.

Larger newspapers and magazines generally recruit reporters who have had one or two years' experience writing for a smaller paper. Reporters usually work alone, investigating the background for a story, interviewing subjects, and producing stories, often under a deadline. Reporters may write about general topics or develop a specialty such as business, sports, or science reporting. They must be able to take accurate notes, use a typewriter or word processor, and use clear objective language.

Technical writing differs from other kinds of writing. It involves converting scientific or technical material into language that is more easily understood. Technical writing frequently explains how to use a particular product. In high technology firms, technical writers produce manuals; document operating and maintenance procedures; and act as a link between engineering, marketing, and the customer. At the entry level, technical writers may begin as junior writers, proofreading or editing written material produced by the engineers, preparing diagrams and charts, or writing simple product



descriptions. At higher levels, they may write technical reports, manuals, and articles for publication in trade publications.

Technical writers generally work in writing departments with other writers. The promotional ladder typically involves a progression from junior writer to writer, senior writer, supervisor, and manager. While high technology industries are perhaps the most visible employers of technical writers, positions can also be found in insurance, banking, health care, and manufacturing.

Advertising agencies hire copywriters to write promotional material about goods and services. Copywriters frequently work as part of a creative team of writers to develop innovative ways to sell a client's product. In the course of their work, they interact with the account executive who obtained the assignment from the client, the art director, and the artist who will communicate the concept visually. Large agencies accept work from a variety of clients, while small firms frequently specialize in advertising a particular industry.

Entry-level positions in copy writing are difficult to obtain. Many firms prefer to hire experienced writers. Firms may approach seasoned personnel from other agencies directly or place recruitment ads in trade magazines. All prospective copywriters need a "book" -- a portfolio containing examples of past work. One way to develop a book is to produce ads or promotional materials on a volunteer or freelance basis for small retailers or other organizations that cannot afford to hire an agency. Aspiring copywriters with no client experience sometimes invent ads for products they think they can promote creatively or write critiques of ads they have seen. The portfolio is an important part of the hiring process. It provides prospective employers with an indication of the applicant's talent, creativity, and capacity for innovation.

Within advertising, positions for writers range from assistant copywriter to copywriter, senior copywriter, and creative director. While promotional opportunities do exist, advertising professionals often change firms as a way of improving their salaries and positions.

Most of the leading advertising firms in Massachusetts are located in Boston, considered one of the best advertising environments in the country. According to *New England Business* magazine, Boston-based agencies are gaining in stature. Three are now on the list of agencies that many national advertisers consult for representation.

Despite the glamour, many of the jobs open to those lacking experience are in clerical ranks. When considering this option, applicants should inquire about opportunities for internal promotion. Retail and wholesale sales firms also employ copywriters to write ads, mail-order catalogs, and promotional flyers.

### **Education, Training, and Hiring Requirements**

Most writing and editing jobs require a four-year degree from a liberal arts program. A journalism or English degree is the most common prerequisite for newspaper, magazine, and public relations work. For college graduates who majored in other fields, a demonstrated strength in writing and editing is often sufficient for copywriting and editing positions. All applicants should enjoy reading and writing and be able to work under pressure. While it is possible for graduates of two-year technical programs to enter technical writing, a four-year degree is usually required for advancement.

### **Industries That Employ Writers and Editors**

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
271	Newspapers	29.1
272	Periodicals	10.6
273	Books	8.5
822	Colleges and Universities	7.8
731	Advertising	7.2
483	Radio and TV Broadcasting	5.1
736	Personnel Supply Services	4.6
737	Computer and Data Processing Services	4.1

### **Occupational Earnings**

Editorial assistants earn a starting salary of \$16,000 on average. Recent journalism and English graduates working as reporters at small daily newspapers earn an average of \$12,000. Salaries in technical writing range from \$20,000 for college graduates to \$50,000 or more for managers. Newly hired copywriters earn about \$15,000; established copywriters, however, may earn over \$100,000.

### **Employment Outlook**

Faster-than-average growth is expected for the writing and editing occupations through 1995, particularly in business services and high technology. Employment is expected to increase between 20 and 34 percent.

Employment of writers and editors is expected to rise faster than average due to the increased demand for salaried writers and editors by newspapers, periodicals, book publishers, and non-profit organizations -- including research agencies and religious, business, professional, and civic associations. Growth of advertising and public relations agencies should also be a source of new jobs.

The outlook for writing and editing jobs is expected to continue to be keenly competitive because the number of college graduates far exceeds the number of positions available. Opportunities will be best in firms that prepare business and trade publications and in technical writing. For those just beginning, small dailies and weekly newspapers and in small radio and T.V. stations offer the best job prospects.

### **Related Occupations**

Fiction and Nonfiction Writer

Newswriter

Script Writer

Publication Editor

Public Relations Specialist

### **Institutions Providing Training in Massachusetts**

#### *Four-Year (Bachelor's) Degree:*

Boston University  
121 Bay State Road  
Boston, MA 02215  
(617) 353-2000

North Adams State College  
Church Street  
North Adams, MA 01247  
(413) 664-4511

Curry College  
Milton, MA 02186  
(617) 333-0500

Northeastern University  
360 Huntington Avenue  
Boston, MA 02115  
(617) 437-2000

Emerson College  
148 Beacon Street  
Boston, MA 02116  
(617) 578-8600

Simmons College  
300 The Fenway  
Boston, MA 02115  
(617) 738-2000

Fitchburg State College  
160 Pearl Street  
Fitchburg, MA 01420  
(508) 345-2151

Suffolk University  
Beacon Hill  
Boston, MA 02108  
(617) 723-4700

Hampshire College  
Amherst, MA 01002  
(413) 549-4600

University of Massachusetts--  
Amherst  
255 Whitmore  
Amherst, MA 01003  
(413) 545-0222

Massachusetts Institute of Technology  
77 Massachusetts Avenue  
Cambridge, MA 02139  
(617) 253-4791



Worcester Polytechnic Institute  
Worcester, MA 01609  
(508) 793-5000

**Where to Write for More Information:**

Women in Communications, Inc.  
P.O. Box 9561  
Austin, TX 78766

The Dow Jones Newspaper Fund  
P.O. Box 300  
Princeton, NJ 08540

American Society of Magazine  
Editors  
575 Lexington Avenue  
New York, NY 10022

Society for Technical Communication,  
Inc.  
815 15th Street, N.W.  
Suite 516  
Washington, D.C. 20005

The Association of Business  
Communications  
100 English Building  
608 South Wright Street  
Urbana, IL 61801

Council of Communication  
Societies  
5100 Saratoga Avenue  
Bethesda, MD 20816

International Association of  
Business Communicators  
870 Market Street, Suite 928  
San Francisco, CA 94102

The Newspaper Guild  
1125 15th Street, N.W.  
Washington, DC 20005

National Newspaper Association  
1627 K Street, N.W., Suite 400  
Washington, DC 20006

The Society of Professional  
Journalists  
Sigma Delta Chi  
35 E. Wacker Drive  
Chicago, IL 60601

American Newspaper Publishers  
Association  
750 Third Avenue  
New York, NY 10017

American Society of Journalists  
& Authors, Inc.  
1501 Broadway  
Suite 1907  
New York, NY 10036

Writer's Digest  
9933 Alliance Road  
Cincinnati, OH 45242

National Writers Club  
1450 S. Havana Street  
Suite 620  
Aurora, CO 80012

## **APPENDIX A**

## Using the Standard Industrial Classification System (SIC)

The Standard Industrial Classification (SIC) system was developed by the federal government to identify and code business establishments according to their industrial activity. All business establishments in the United States, are categorized by SIC code. Because it is a standardized system, the SIC is used by federal, state and local governments to collect, analyze, and publish aggregate data about business activity. The SIC organizes firms, or "economic establishments," producing similar goods or services into ten broad divisions called "industries."

Agriculture, Forestry, Fishing  
Mining  
Construction  
Manufacturing  
Transportation and Public Utilities  
Wholesale Trade  
Retail Trade  
Finance, Insurance, Real Estate  
Services  
Public Administration

The Government Printing Office publishes a reference guide, the *Standard Industrial Classification Manual*, used by state agencies such as the Massachusetts Department of Employment and Training to classify and study the performance of these industries at the local level. Career counselors and vocational program administrators can use the manual when interpreting government reports on local industries.

For purposes of the SIC, an economic establishment is defined as an economic unit where business is conducted or where services or industrial operations are performed. For example, individual plants operated in several cities and towns by one large company are each considered economic establishments in their respective towns. Under the ten broad categories are more than ninety separate "industry groups," each classified according its own two-digit code. Each two-digit industry group is further broken down into detailed three-digit "industries."

For example, the SIC system defines the service industry as "those establishments primarily engaged in providing a wide variety of services for individuals, business and government establishments, and other organizations." In all, there are fourteen two-digit SIC industry groups within the broad services industry. They range in diversity from hotels and other lodging places, health services, and business services to educational services. The business services industry group, for example, consists of firms that provide services for other businesses, including advertising (SIC 731),



services to buildings (SIC 734), personnel supply services (SIC 736), and computer and data processing services (SIC 737).

An understanding of the SIC system is important in career counseling, job development, and job placement for several reasons. First, most industry and employment data bases are organized by the SIC system. Published reports and government studies generally refer to industries by SIC code. Second, the SIC system allows us to track the performance of various segments of the state economy and, more importantly, to assess job prospects among various industries in the state. Because industries do not perform equally well, career counselors can use the SIC to monitor industries for growth or decline and then target job development efforts and client referrals toward areas of new employment opportunity. The third reason for using the SIC is that occupation and skill requirements involved in producing products and services vary widely. For example, apparel manufacturing firms are dominated by occupations characterized by relatively low skill levels. In contrast, the health and hospital industry is dominated by occupations requiring workers with advanced education and training. By organizing our information according to the SIC system, we can gain insight into the staffing patterns of individual industries.

The *Massachusetts Occupational Outlook*, *High Technology Careers in Massachusetts*, *The Job Guide*, and most other labor market information data sources all use the SIC designations to present industry and employment data. Each occupation description in the *Outlook* and *High Technology Careers* contains a section listing the major industry employers for the occupation under discussion. For example, the description for "Writers and Editors" on page 77 of *High Technology Careers*, lists five major industries that employ significant numbers of writers and editors in Massachusetts and indicates their level of concentration within those industries:

Industries That Are Major Employers  
of Writers and Editors

<u>SIC</u>	<u>Industry</u>	<u>Percentage of Occupation</u>
273	Book Publishing	16.4
271	Newspaper Publishing	9.3
739	Miscellaneous Business Services	8.3
357	Office and Computing Machinery Manufacturing	7.4
737	Computer and Data Processing Services	6.4

Volumes 1 and 2 of *The Job Guide* contain the names and addresses of individual firms located in various geographic areas of the state organized by three-digit SIC industries. Someone interested in one of the occupations described in detail in the *Outlook* or *High Technology Careers* can consult the appropriate section of either Volume 1 or 2 of *The Job Guide* for information about specific employers.

Using the example above, someone from the eastern part of the state interested in a career as a writer or editor can locate the occupation within key industries using the information provided in *High Technology Careers*. If the job seeker is interested in book publishing, for instance, he or she can consult Volume 1 of *The Job Guide* for name and address listings of the establishments within SIC 273 in preferred geographic areas. Listings in the *Guide* also give an indication of the size of the firms. The job seeker can contact the personnel directors of business establishments listed under SIC 273 to find out how many writers the firms hire and whether there are any current or anticipated openings. The third volume of *The Job Guide* provides information on employment levels and occupational staffing patterns of Massachusetts industries; it also identifies industries in which individual occupations tend to be concentrated.

## **Appendix B**

### **An Overview of Vocational Education in Massachusetts**

by John McDonagh  
Division of Occupational Education



## HISTORICAL BACKGROUND

In Massachusetts, vocational education programs have a long and vibrant history paralleling much of the industrial growth and change that has occurred in the state. The growth of vocational education in Massachusetts is due to three key factors: (a) grassroots support from citizens in the cities and towns that built the facilities and designed and operated the programs; (b) a long-standing commitment from the state to a considerable level of involvement in the forms of financial aid (reimbursement), technical assistance, and oversight; and (c) targeted financial assistance from the federal government.

Vocational education in Massachusetts has been shaped by several major developments since the turn of the century. In 1905, Governor William I. Douglas approved a resolution of the Massachusetts Legislature creating a Commission on Industrial and Technical Education. After a series of 24 meetings, the Commission recommended the creation of a system of vocational schools across the state. This was the "birth" of the first state system of vocational education in the country. In 1917, the United States Congress passed the Smith-Hughes Act and thereby established federal involvement in vocational education through funding and program direction. During the next few decades, several state and federal legislative acts further influenced vocational education, especially by adding program areas to the original emphasis on agricultural and industrial fields of study. The positive image of vocational schools in Massachusetts was further enhanced in the 1940s by their outstanding contribution to the wartime effort to increase production and train new labor market entrants, particularly females, for a range of jobs.

Another major expansion began in the 1950s with a series of industry and community surveys that documented the need for the construction of regional facilities. These facilities were needed to serve the increasing school-age population and to assist employers with both training new entrants to the workforce and in meeting the upgrading needs of current personnel. Between 1962 and 1978, a total of 26 regional vocational-technical schools opened to serving 217 cities and towns. In many cases, these new regional schools absorbed the staff and students from one or more existing vocational schools in the area. Both federal and special state financial assistance provided important backing to this rapid expansion of learning opportunity.

As a result of the surveys of industry and community input through public hearings and town meetings, the program offerings of vocational education expanded considerably with the development of regional vocational school districts. Technical subject areas such as drafting, electronics, and data processing were included in many

of these new facilities; and program areas such as health occupations expanded their occupational focus.

City and town vocational schools, the foundation of the original vocational education movement in Massachusetts, have expanded and modernized over the past three decades. Strong community support for vocational education is evident in the construction of new facilities in Holyoke and Springfield during the 1985-1989 years.

The state of Massachusetts established 15 community colleges during the 1955-1973 period. Most of these new colleges concentrated initially on the academic and general courses that students needed to succeed at a four-year college or university or to develop general life skills. The decades of the 1970s and 1980s, however, have seen an increase in the career and occupational program offerings at these two-year public postsecondary institutions. An emerging development which promises to clear a new pathway to educational and career success for students is the "tech-prep" (two plus two) program of studies that connects the last two years of high school study with a two-year program of study in a technical subject area at a community college or technical institute.

## **GOVERNANCE STRUCTURE**

### **State Board of Education**

The Massachusetts State Board of Education, by law, has planning and policy-setting responsibility for occupational and vocational-technical education for the Commonwealth. The State Board recognizes that it shares responsibility with school committees and postsecondary governing boards to provide leadership and direction for occupational and vocational-technical education. The State Board and the Board of Regents of Higher Education published a revised Joint Policy on Occupational Education on November 26, 1986. The Joint Policy is intended to give direction to planning for collaboration and cooperation by identifying important areas of agreement between the two Boards regarding occupational education.

### **Division of Occupational Education Department of Education**

The state administration of occupational and vocational-technical education is overseen by the Massachusetts Board of Education. The Division of Occupational Education is directly responsible for the various aspects of administering and supervising both federally-funded and state-approved (Chapter 74) occupational and vocational-technical education programs.



The Division of Occupational Education, headed by the Associate Commissioner, is organized into six bureaus that supervise and implement the many diverse activities associated with occupational programming:

- Administrative Services
- Education, Training, and Employment
- Financial Management
- Planning, Research, and Evaluation
- Postsecondary Occupational Education
- Program Services

The Massachusetts Department of Education operates six Regional Education Centers in addition to the central office in Quincy. Each of these Centers has a Regional Center Director and a Team Leader for Occupational Education. The Team Leader and staff provide direct technical assistance to school districts, community colleges, other service providers, and the general public. This technical assistance ranges from helping schools prepare applications for federal funds to coordinating on-site evaluations of programs.

#### **State Council on Vocational Education**

The State Council on Vocational Education is an advisory group established by federal law (Perkins Act) and composed of thirteen members. The Perkins Act requires that seven of the Council's members be from the private sector (five from business and industry and two from labor organizations). The remaining six members are drawn from secondary and postsecondary vocational education institutions, career guidance and counseling organizations, and representatives of special populations.

The State Council's duties include advising on the development of the State Plan; consulting on the development of criteria for evaluating vocational education programs; and recommending procedures for the further involvement of business, industry, and labor in vocational education programs. The State Council also is responsible for evaluating the vocational education program delivery systems assisted under the Perkins Act and the Job Training Partnership Act and making recommendations on the effectiveness of coordination between the two Acts.

The Massachusetts State Commission on Vocational Education has operated a special project on coordination between community colleges and school districts over the past three years. This project has sponsored the Leadership Committee on Coordination, a statewide meeting in September 1987, and the development of an inventory of joint agreements. A second statewide meeting is planned for 1989 with



the development of a publication on recommended practices for successful coordination.

Inquiries about the State Council on Vocational Education may be directed to Abigail Slayton, Executive Director, Massachusetts Council on Vocational Education, State House, Room 51, Boston, MA 02133.

### **The Massachusetts Commission for Occupational Education**

The Massachusetts Commission for Occupational Education is an advisory group established by state law (Chapter 837 of the Acts of 1969) and composed of sixteen members. Ten members are appointed by the State Board of Education; six are appointed by the State Board of Regents for Higher Education. Each member represents a group or an organization affected by occupational and vocational-technical education. The Associate Commissioner of Occupational Education serves as executive secretary to the Commission.

This excerpt from Chapter 837 provides the mission statement for the Commission:

The Commission shall make recommendations to the Board of Education through its Division of Occupational Education relative to the formulation, administration, implementation and supervision of the State Plan for occupational, vocational and technical education, shall from time to time suggest to said division new programs in occupational education and in the field of research and development, and shall report its evaluations of existing occupational education program services and activities together with recommendations for any necessary changes for the purpose of assisting said division in coordinating, promoting and establishing such programs.

The Commission has established the following priority topics for its focus for 1989-1990:

- Reauthorization of Perkins Act (P.L. 98-524)
- Vocational Teacher Preparation
- Special Education/Vocational Education
- School Finance Reform
- Status of Vocational Education in Boston
- Secondary/Postsecondary Interface School/College Collaboratives
- Organization of Employment-Related Education and Training

Inquiries about the Massachusetts Commission for Occupational Education may be directed to John McDonagh, Division of Occupational Education, 1385 Hancock Street, Quincy, MA 02169.

## **Service Providers**

Massachusetts supports a locally based delivery system for occupational and vocational-technical education. In general, for city and town schools, local administration rests with the staff appointed by an elected or appointed school committee or board of trustees. For regional schools with several communities as members, certain administrative decisions require the approval of two-thirds of the member cities and towns.

Chapter 74 of the Massachusetts General Laws, as amended by Chapter 731 of the Acts of 1988, governs state-approved and state-aided vocational-technical education programs in these areas: agriculture, allied health, automotive, construction, marketing, service occupations, industrial manufacturing, and technical programs. The Chapter 74 regulations associated with this law identify ten factors or criteria that a program must satisfy in order to be eligible for state aid: organization, control, location, equipment, courses of study, qualifications of teachers, methods of instruction, conditions of admission, employment of pupils, and expenditures.

Occupational or "non-Chapter 74" programs are offered in the areas of business and office occupations, technology education (industrial arts), and consumer and homemaker skills. These programs are not subject to the special requirements of the Chapter 74 regulations and are sometimes organized as individual courses.

Funding for occupational and vocational-technical education comes from local, state, and federal sources. Federal funds provide about 6 percent of total costs; the remaining 94 percent is covered by local and state funds.

The facilities where occupational and vocational-technical education programs are offered include locations in 220 school districts and 18 postsecondary institutions (community colleges and technical institutes). These facilities consist of a variety of organizational structures, ranging from an individual school in one city or town to a regional school with several cities and towns as members. Three county agricultural schools offer specialized programs for Essex, Norfolk, and Bristol counties. Many

secondary and postsecondary program service providers accept students from outside of the immediate district or area.

Enrollments in these occupational and vocational-technical education programs are monitored on both an individual school and statewide basis. During school year 1987-88, 54 percent of public high school students were enrolled in occupational or vocational-technical education programs.

The Division of Occupational Education also collects and reviews data on student placement and follow-up for Chapter 74 vocational-technical education programs. Both student and employer satisfaction studies are conducted, and these studies have demonstrated high levels of satisfaction from both recent program graduates (two to four years out of school) and their supervisors. The findings of the most recent study (Abt Associates, Inc., 1987) have been used in the development of the State Plan.

The Board of Regents for Higher Education and its staff oversee the operations of the 15 community colleges. Other service providers that receive federal vocational education funds are community-based organizations that usually work in conjunction with a school district or community college to provide specific populations with the support services that are necessary to acquire skills training and vocational-technical education.

Private sector representatives provide an important service to vocational-technical education through participation on program and general advisory committees. Each Chapter 74 program must have an active advisory committee with membership from business, industry, and labor relevant to the occupation and from parents and students. Each school that operates one or more Chapter 74 programs must have a General Advisory Committee that must include the chairman of each program advisory committee. Chapter 74 advisory committees make significant contributions to the quality of vocational-technical programming; for example, labor market conditions and trends, validation of tasks and competencies, equipment and facilities advice, career guidance and placement, professional development, community public relations, and program evaluation. The Division of Occupational Education sponsored the development of a Guide to the Effective Utilization of Vocational Technical Advisory Committees. This guide was disseminated in training sessions across the state in September 1987 and is available upon request.



## **REGIONAL EDUCATION CENTERS**

Contact the Regional Education Center in your area and ask for a member of the Occupational Education Team.

- I. Greater Boston Regional Education Center**  
75 Acton Street  
Ottoson School  
Arlington, MA 02174  
641-4870  
Regional Center Director: Marlene Godfrey  
Team Leader: Dr. Naisuon Chu
- II. Northeast Regional Education Center**  
790 Turnpike Street  
North Andover, MA 01845  
Centrex 727-0600  
Regional Center Director: Joseph McKeigue  
Team Leader: Ms. Dina Hamilton
- III. Central Massachusetts Regional Education Center**  
Beaman Street  
Route 140  
West Boylston, MA 01583  
835-6267 or 7/1346  
Regional Center Director: Joan Schuman  
Team Leader: Paul Carbone
- IV. Southeast Regional Education Center**  
P.O. Box 29  
Middleboro, MA 02346  
947-1231 or 7/1440  
Regional Center Director: Thomas Miranda  
Team Leader: Angela Avery
- V. Springfield Regional Education Center**  
Szatela School  
Macek Drive  
Chicopee, MA 01013  
(413) 594-8511 or (413) 594-8512  
Regional Center Director: Anne Schumer  
Team Leader: Dr. Joseph Cangro

**VI. Northwest Regional Education Center**  
**Berkshire Plaza**  
**37 Main Street**  
**North Adams, MA 01248**  
**(413) 664-7101**  
**Regional Center Director: Ronald Areglado**  
**Team Leader: Jim Shiminski**

## OCCUPATIONAL PROGRAMS OFFERED IN MASSACHUSETTS\*

### Agricultural

S Agricultural Production  
 S,P Animal Science  
 S Plant Science  
 S Small Animal Science  
 S Poultry Science  
 P Animal Technology (Grooming)  
 P Agriculture Mechanics  
 P Food Products  
 S,P Ornamental Horticulture  
 S Arboriculture  
 S,P Floriculture  
 S Landscaping  
 P Nursery Operation and Management  
 P Agriculture Resources  
 P Natural Resources/Forestry  
 S Natural Resources/Wildlife  
 S Other Agriculture

### Health Occupations

P Dental Assistant  
 P Dental Hygiene  
 P Medical Laboratory Assistant  
 S,P Medical Laboratory Technician, Other  
 P Nursing (Associate Degree)  
 P Practical Nursing  
 S,P Nursing Aide  
 P Surgical Technology  
 P Nursing, Other  
 P Rehabilitation  
 P Radiologic Technology  
 P Ophthalmic Technician  
 P Mental Health Technology  
 P Inhalation Therapy  
 S,P Medical Assistant  
 P Health Aide  
 P Health Occupation, Other

### Distributive Education

S,P Apparel & Accessories  
 S,P Finance & Credit  
  
 S,P Food Services  
 S,P General Merchandise  
 P,S Hotel & Lodging  
 S,P Real Estate  
 P Recreational Tourism  
 S Small Business Management

### Office Occupations

S,P Accounting & Computing  
 S Computer & Console Operation  
 S,P Programmer  
 S,P Other Business Data Processing  
 S Filing, Office Machines  
 S,P Information Communication  
 S Materials Support  
 S Personnel Training & Relations  
 S,P Steno, Secretarial and Related Occupations  
 S,P Supervisory and Administrative Management  
 S,P Typing and Related Occupations  
 S Other Office Occupations

\*S = Secondary Level Program; P = Postsecondary Level Program



## Consumer & Homemaking

S	Comprehensive Homemaking
S	Child Development
S	Clothing & Textiles
S	Consumer Education
S	Family Health
S	Family Living and Parenting
S	Food and Nutrition
S	Home Management
S	Housing and Home Furnishings
S	Other Homemaking
S,P	Care and Guidance of Children
S	Clothing Management, Production, and Services
S,P	Food Management, Production, and Services
S	Institutions & Home Management and Services

## Technical Occupations

P	Architectural Technology
P	Automotive Technology
S	Chemical Technology
P	Civil Technology
P	Electrical Technology
S,P	Electronic Technology
P	Electromechanical Technology
P	Environmental Control Technology
P	Industrial Technology
P	Mechanical Technology
S	Scientific Data Technology
S,P	Programmer
P	Fire & Safety Technology
P	Policy Science Technology
S	Communications Technology
P	Other Technical Education
S	Packaging Technology
S	Radio & TV Production
S	Business
S	Packaging Mechanics

## Trade and Industry

S,P	Air Conditioning
S	Appliance Repair
S	Body & Fender Repair
S	Auto Mechanics
S,P	Commercial Art Occupations
S	Carpentry
S,P	Electricity
S	Heavy Equipment Operation & Maintenance
S	Masonry
S	Painting & Decorating
S	Plumbing & Pipefitting
S	Construction & Maintenance, Other
S	Custodial Services
S,P	Diesel Mechanic
S,P	Drafting Occupations
S	Electrical Occupations
S	Electronic Occupations
S	Radio & TV Repair
S,P	Graphic Arts Occupations
S	Printing Press Occupations
S	Instrument Maintenance & Repair
S,P	Machine Shop
S	Sheet Metal
S,P	Welding & Cutting
S	Metal Patternmaking
S	Metal Working, Other (Fabricating)
S,P	Cosmetology
S	Plastics Occupations
S	Quantity Food Occupations
P	Baking
S,P	Cook/Chef
S	Small Engine Repair
S	Stationary Energy Sources
S	Textile Production & Fabrication
S	Upholstering
S	Woodworking/Cabinetmaking
S	Industrial Sewing Machine Repair

## **Appendix C**

### **Chapter 74 Vocational-Technical Programs -- 1989**

# CHAPTER 74 VOCATIONAL-TECHNICAL PROGRAMS -- 1989

0007 Amesbury PS  
Town Hall Annex  
Amesbury, MA 01913

Stephen Gerber  
508-388-0507

CODE	CIP TITLE	LEVEL
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080708	General Marketing	S
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0016 Attleboro PS  
Rathbun Willard Dr.  
Attleboro, MA 02703

Robert S. Haggerty  
508-222-0012

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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150303	Electronic Technology	S	200201	Child Care & Guid.	S
200401	Food Prod., Mgmt. & Serv.	S		Mgt. & Serv.	S
460201	Carpentry	S	460302	Electrician	S
470604	Automotive Mechanics	S	480101	Drafting, General	S
480201	Graphic & Printing Commun.	S	480203	Commercial Art	S
480503	Machine Tool/Machine Shop	S	480504	Metal Fabrication	S

0025 Bellingham PS  
11 South Main St.  
Bellingham, MA 02019

Peter Vangel  
508-883-1706

CODE	CIP TITLE	LEVEL
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080708	General Marketing	S
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0030 Beverly PS  
4 Colon St.  
Beverly, MA 01915

Edmund W. Barry, Jr.  
508-922-0316

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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080708	General Marketing	S	460201	Carpentry	S
470604	Automotive Mechanics	S	480208	Printing Press Occupaton	S
480503	Machine Tool/Machine Shop	S	480703	Millwork & Cabinetmaking	S

0035 Boston PS  
26 Court St.  
Boston, MA 02108

Thomas Giacchetto  
617-442-5200

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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010302	Animal Prod.	S	010601	Horticulture	S
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030101	Renewable Nat. Resource	S	060701	Hotel/Motel Mgt.	S
080401	Financial Serv. Mktg.	S	080708	General Mktg.	S
100104	Radio & TV Prod. & Broadcast	S	110201	Computer Prog.	S
120403	Cosmetology	S	150303	Electronic Tech.	S
170399	Medical Lab Tech., Other	S	170402	Community Health Wk.	S
170508	Physician Assisting	S	170602	Nursing Assisting	S
200201	Child Care &	S	200301	Clothing Mgmt.,	S
	Guid. Mgmt. & Serv.			Prod. & Serv.	
200401	Food Prod., Mgmt. & Serv.	S	460201	Carpentry	S
460302	Electrician	S	460401	Bldg. & Prop. Maint.	S
460501	Plumbing & Pipefitting	S	470201	Heating, A/C,	S
470603	Automotive Body Repair	S		Refrig. Mech.	
470604	Automotive Mech.	S	470606	Small Engine Repair	S
480101	Drafting, General	S	480201	Graphic & Printing Commun.	S
480203	Commercial Art	S	480204	Commercial Photography	S
480303	Upholstering	S	480503	Machine Tool/Machine Shop	S
480506	Sheet Metal	S	480508	Welding	S
480703	Millwork & Cabinetmaking	S			

0044 Brockton PS  
43 Crescent St.  
Brockton, MA 02401

Joseph Harte  
508-580-7511

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	200401	Food Prod., Mgmt. Serv.	S
460201	Carpentry	S	470604	Automotive Mechanics	S
480208	Printing Press	S			

0049 Cambridge PS  
159 Thorndike St.  
Cambridge, MA 02141

Karen Prentice  
617-498-9200

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
200403	Chef/Cook	S	460201	Carpentry	S
460302	Electrician	S	470603	Automotive Body Repair	S
470604	Automotive Mechanics	S	480101	Drafting, General	S
480503	Machine Tool/Machine Shop	S	480504	Metal Fabrication	S

0056 Chelmsford PS  
75 Granteville Rd.  
North Chelmsford, MA 01863

Alan Bradshaw  
508-251-4961

CODE	CIP TITLE	LEVEL
080708	General Marketing	S

0061      Chicopee PS  
 180 Broadway  
 Chicopee, MA 01020

Douglas A. Gray  
 413-592-6111

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	150303	Electronic Tech.	S
460201	Carpentry	S	460303	Electrician	S
470603	Automotive Body Repair	S	470604	Automotive Mechanics	S
480101	Drafting, General	S	480504	Metal Fabrication	S

0071      Danvers PS  
 76 Pickering St.  
 Danvers, MA 01923

Calvin L. Cleveland  
 508-774-4800

CODE	CIP TITLE	LEVEL
080708	General Marketing	S

0072      Dartmouth PS  
 P.O. Box 178  
 South Dartmouth, MA 02748

John T. MacDonald  
 508-997-3391

CODE	CIP TITLE	LEVEL
080708	General Marketing	S

0082      Duxbury PS  
 130 St. George St.  
 Duxbury, MA 02332

Donald G. Kennedy  
 617-934-5601

CODE	CIP TITLE	LEVEL
080708	General Marketing	S

0093      Everett PS  
 121 Vine St.  
 Everett, MA 02149

Michael Adams  
 617-389-7950

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
460302	Electrician	S	460408	Painting & Decorating	S
470603	Automotive Body Repair	S	470604	Automotive Mechanics	S
480201	Graphic & Printing Commun.	S	480303	Upholstering	S
480503	Machine Tool/Machine Shop	S	480506	Sheet Metal	S
480703	Millwork & Cabinetmaking	S			

0095 Fall River PS  
417 Rock St.  
Fall River, MA 02720

Stephan Uchman  
508-678-4571

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
110201	Computer Programming	S	120403	Cosmetology	S
170602	Nursing Assisting	S	200201	Child Care &	S
200301	Clothing Mgmt. Prod.& Serv.	S		Guid. Mgt. & Serv.	
200401	Food Prod., Mgmt. & Serv.	S	470106	Major Appliance Repair	S
470199	Ind. Sewing Machine Repair	S	470606	Small Engine Repair	S
			480203	Commercial Art	S

0101 Franklin PS  
Oak Street  
Franklin, MA 02038

Dorothy Swanbeck  
508-528-5600

CODE	CIP TITLE	LEVEL
080708	General Marketing	S

0107 Gloucester PS  
Blackburn Cir.  
Gloucester, MA 01930

Scott Waddleton  
508-281-2873

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
460201	Carpentry	S	460302	Electrician	S
470604	Automotive Mechanics	S	480503	Machine Tool/Machine Shop	S

0114 Greenfield PS  
64 North St. Ext.  
Greenfield, MA 01301

John O'Brien  
413-774-2362

CODE	CIP TITLE	LEVEL
080708	General Marketing	S

0122 Hanover PS  
848 Main St.  
Hanover, MA 02339

Robert P. Fox  
617-878-0786

CODE	CIP TITLE	LEVEL
080708	General Marketing	S



0128 Haverhill PS  
4 Summer, Rm 104  
Haverhill, MA 01830

Thomas Fowler-Finn  
508-374-1901

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
150303	Electronic Technology	S	200201	Child Care & Guid. Mgt. & Serv.	S

0137 Holyoke PS  
98 Suffolk  
Holyoke, MA 01040

Walter Welch  
413-534-5678

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
120403	Cosmetology	S	150303	Electronic Technology	S
170605	Practical Nursing	P	200401	Food Prod., Mgmt. & Serv.	S
460201	Carpentry	S	460302	Electrician	S
470604	Automotive Mechanics	S	480503	Machine Tool/Machine Shop	S
480504	Metal Fabrication	S			

0142 Hull PS  
81 Central Ave.  
Hull, MA 02045

Richard P. Charlton  
617-925-0771

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	110201	Computer Programming	S

0149 Lawrence PS  
58 Lawrence ST.  
Lawrence, MA 01840

James F. Scully  
508-682-9020

CODE	CIP TITLE	LEVEL
080708	General Marketing	S

0150 Lee PS  
Crossways  
Lee, MA 01238

Henry Cukowski  
413-243-2100

CODE	CIP TITLE	LEVEL
460201	Carpentry	S

0153 Leominster PS  
261 West St.  
Leominster, MA 01453

Roger Melanson  
508-534-7735

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	150303	Electronic Tech.	S
460201	Carpentry	S	460302	Electrician	S
470603	Automotive Body Repair	S	470604	Automotive Mechanics	S
480101	Drafting, General	S	480201	Graphic & Printing Commun.	S
480503	Machine Tool/Machine Shop	S	480508	Welding	S

0160 Lowell PS  
89 Appleton  
Lowell, MA 01852

Henry Mroz  
508-454-5431

CODE	CIP TITLE	LEVEL
080708	General Marketing	S

0163 Lynn PS  
42 Franklin  
Lynn, MA 01902

Al Malagrifa  
617-593-1680

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	110201	Computer Programming	S
120403	Cosmetology	S	150303	Electronic Tech.	S
200410	Food Prod., Mgmt. & Serv.	S	460201	Carpentry	S
460302	Electrician	S	460408	Painting & Decorating	S
460501	Plumbing & Pipefitting	S	470603	Automotive Body Repair	S
470604	Automotive Mechanics	S	480101	Drafting, General	S
480201	Graphic & Printing Commun.	S	480503	Machine Tool/Machine Shop	S
480504	Metal Fabrication	S			

0165 Malden PS  
77 Salem St.  
Malden, MA 02148

Paul Scagnelli  
617-324-8000

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
460201	Carpentry	S	460302	Electrician	S
470604	Automotive Mechanics	S	480101	Drafting, General	S
480201	Graphic & Printing Commun.	S	480506	Sheet Metal	S

0171 Marshfield PS  
76 South River  
Marshfield, MA 02050

Daniel J. Bresnahan  
617-837-1335

CODE	CIP TITLE	LEVEL
080708	General Marketing	S

0176	Medford PS 489 Winthrop Medford, MA 02155	Lawrence Volpe 617-396-5800
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CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	120403	Cosmetology	S
150303	Electronic Tech.	S	460302	Electrician	S
460408	Painting & Decorating	S	470603	Automotive Body Repair	S
470604	Automotive Mechanics	S	480101	Drafting, General	S
480201	Graphic & Printing Commun.	S	480503	Machine Tool/Machine Shop	S
480504	Metal Fabrication	S	480703	Millwork & Cabinetmaking	S

0181	Methuen PS 160 Merrimack Methuen, MA 01844	Paul Zdanowicz 508-681-1300
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CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	110201	Computer Programming	S
0182	Middleborough PS Town Hall Middleborough, MA 02346	Lincoln D. Lynch 508-947-3450			

CODE	CIP TITLE	LEVEL
080708	General Marketing	S
0185	Milford PS 31 West Fountain Milford, MA 01757	John Pilla 508-473-0505

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	150303	Electronic Technology	S
480101	Drafting, General	S	480201	Graphic & Printing Commun.	S
480703	Millwork & Cabinetmaking	S			
0204	Newburyport PS 70 Low Newburyport, MA 01950	Francis T. Bresnahan 508-465-5322			



CODE	CIP TITLE	LEVEL
080708	General Marketing	S

0207      Newton PS  
100 Walnut  
Newtonville, MA 02160

Daniel Malia  
617-552-7590

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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150303	Electronic Technology	S
460201	Carpentry	S
470201	Heating, A/C, Refrig. Mech.	S
480101	Drafting, General	S

200403	Chef/Cook	S
460302	Electrician	S
470603	Automotive Body Repair	S
470604	Automotive Mechanics	S
480201	Graphic & Printing Commun.	S

0214      Northbridge PS  
87 Linwood Ave.  
Whitinsville, MA 01588

Harry Simonian  
508-234-8156

CODE	CIP TITLE	LEVEL
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480703	Millwork & Cabinetmaking	S
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0220      Norwood PS  
P.O. Box 67  
Norwood, MA 02062

William Maher  
617-762-6804

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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080708	General Marketing	S
120403	Cosmetology	P
200301	Clothing Mgmt. Prod. & Serv.	S
200401	Food Prod., Mgmt. & Serv.	S

120403	Cosmetology	S
170605	Practical Nursing	P
200301	Clothing Mgmt. Prod. & Serv.	P
200401	Food Prod., Mgmt. & Serv.	P

0229      Peabody PS  
3 King St. Ext.  
Peabody, MA 01960

Peter Mooney  
508-531-1600

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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080708	General Marketing	S
460201	Carpentry	S
470603	Automotive Body Repair	S
480503	Machine Tool/Machine Shop	S

150303	Electronic Technology	S
460302	Electrician	S
470604	Automotive Mechanics	S

0236      Pittsfield PS  
P.O. Box 1187  
Pittsfield, MA 01201

Raymond Cooke  
413-499-2920

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
010601	Horticulture	S	080708	General Marketing	S
110201	Computer Programming	S	120403	Cosmetology	S
150303	Electronic Technology	S	200401	Food Prod., Mgmt. & Serv.	S
460201	Carpentry	S	460401	Bldg. & Prop. Maint.	S
470603	Automotive Body Repair	S	470604	Automotive Mechanics	S
470606	Small Engine Repair	S	480101	Drafting, General	S
480201	Graphic & Printing Commun.	S	480503	Machine Tool/Machine Shop	S
480504	Metal Fabrication	S			

0243      Quincy PS  
70 Coddington  
Quincy, MA 02169

Joseph Mazzarella  
617-786-8796

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
150303	Electronic Technology	S	170402	Community Health Work	S
200401	Food Prod., Mgmt. & Serv.	S	460302	Electrician	S
460501	Plumbing & Pipefitting	S	470201	Heating, A/C, Refrig. Mech.	S
470603	Automotive Body Repair	S	480201	Graphic & Printing Commun.	S
470604	Automotive Mechanics	S	480506	Sheet Metal	S
480503	Machine Tool/Machine Shop	S	480508	Welding	S
480703	Millwork & Cabinetmaking	S			

0246      Reading PS  
P.O. Box 180  
Reading, MA 01867

Robert S. Wells  
617-944-5800

CODE	CIP TITLE	LEVEL
080708	General Marketing	S

0248      Revere PS  
101 School St.  
Revere, MA 02151

William J. Hill  
617-284-0480

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	470604	Automotive Mechanics	S
480201	Graphic & Printing Commun.	S	480703	Millwork & Cabinetmaking	S

0258 Salem PS  
29 Highland Ave.  
Salem, MA 01970

Robert L. Pesce  
508-745-9300

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
150303	Electronic Technology	S	200401	Food Prod., Mgmt. & Serv.	S
460302	Electrician	S	470604	Automotive Mechanics	S

0273 Someset PS  
Wood & County Sts.  
Somerset, MA 02726

Thomas J. Daley  
508-674-3508

CODE	CIP TITLE	LEVEL
080708	General Marketing	S

0274 Somerville PS  
81 Highland Ave.  
Somerville, MA 02143

Vincent Callaghan  
617-666-5700

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	120403	Cosmetology	S
150303	Electronic Technology	S	170602	Nursing Assisting	S
200401	Food Prod., Mgmt. & Serv.	S	460201	Carpentry	S
460302	Electrician	S	460408	Painting & Decorating	S
470603	Automotive Body Repair	S	470604	Automotive Mechanics	S
480101	Drafting, General	S	480201	Graphic & Printing Commun.	S
480503	Machine Tool/Machine Shop	S	480506	Sheet Metal	S

0278 South Hadley PS  
116 Main  
South Hadley, MA 01075

Chester L. Town  
413-538-7516

CODE	CIP TITLE	LEVEL
080708	General Marketing	S

0281 Springfield PS  
195 State  
Springfield, MA 01103

Thomas J. Donahoe  
413-787-7100

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
120403	Cosmetology	S	170602	Nursing Assisting	S
200301	Clothing Mgmt., Prod., & Services	S	200401	Food Prod., Mgmt. & Serv.	S
460302	Electrician	S	460201	Carpentry	S
470604	Automotive Mechanics	S	470501	Stationary Energy Sources	S
			480203	Commercial Art	S



480201	Graphic & Printing Commun.	S	480506	Sheet Metal	S
480508	Welding	S	480703	Millwork & Cabinetmaking	S

0284	Stoncham PS 149 Franklin St. Stoncham, MA 02180		Frank R. Matrese 617-438-0600
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CODE	CIP TITLE	LEVEL
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080708	General Marketing	S
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0285	Stoughton PS 232 Pearl Stoughton, MA 02072		John G. Murray 617-344-4000
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CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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080708	General Marketing	S	110201	Computer Programming	S
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0295	Tewksbury PS 1469 Andover Tewksbury, MA 01876		John W. Wynn 508-851-7347
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CODE	CIP TITLE	LEVEL
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080708	General Marketing	S
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0305	Wakefield PS 525 Main Wakefield, MA 01880		Stephen F. Maio 617-245-6307
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CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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080401	Financial Services Mktg.	S	080708	General Marketing	S
150303	Electronic Technology	S	200201	Child Care &	S
200401	Food Prod., Mgmt. & Serv.	S		Guid. Mgt. & Serv.	

0308	Waltham PS 488 Main Waltham, MA 02154		Marsha McDonough 617-893-8050
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CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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080708	General Marketing	S	150303	Electronic Technology	S
460201	Carpentry	S	470201	Heating, A/C, Refrig. Mech.	S
470603	Automotive Body Repair	S	470604	Automotive Mechanics	S
480101	Drafting, General	S	480503	Machine Tool/Machine Shop	S
480201	Graphic & Printing Commun.	S			
480506	Sheet Metal	S			

0310 Wareham PS  
54 Marion Rd.  
Wareham, MA 02571

Edwin Denton  
508-295-0003

CODE	CIP TITLE	LEVEL
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080708	General Marketing	S
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0314 Watertown PS  
30 Common  
Watertown, MA 02172

Daniel G. O'Connor  
617-926-7700

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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080708	General Marketing	S	200201	Child Care & Guid. Mgt. & Serv.	S
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0316 Webster PS  
Box 430  
Webster, MA 01570

Jeremiah A. Moriarty  
508-943-0104

CODE	CIP TITLE	LEVEL
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080708	General Marketing	S
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0325 Westfield PS  
22 Ashley  
Westfield, MA 01085

Alfred R. Rios  
413-568-9592

150303	Electronic Technology	S	170602	Nursing Assisting	S
460201	Carpentry	S	460302	Electrician	S
470604	Automotive Mechanics	S	480503	Machine Tool/Machine Shop	S

0332 West Springfield PS  
26 Central  
West Springfield, MA 01089

Felix J. Torromeo  
413-781-7550

CODE	CIP TITLE	LEVEL
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080708	General Marketing	S
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0336 Weymouth PS  
111 Middle  
Weymouth, MA 02189

Eugene Stenstrom  
617-335-1460

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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120403	Cosmetology	S	150303	Electronic Technology	S
460201	Carpentry	S	460401	Bldg. & Prop. Maint.	S

470603	Automotive Body Repair	S	470604	Automotive Mechanics	S
480101	Drafting, General	S	480201	Graphic & Printing Commun.	S
480506	Sheet Metal	S	480703	Millwork & Cabinetmaking	S

0346 Winthrop PS  
45 Pauline St.  
Winthrop, MA 02152

Joseph Laino  
617-846-5500

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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080708	General Marketing	S	170402	Community Health Work	S
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0348 Worcester PS  
20 Irving  
Worcester, MA 01609

John E. Durkin  
508-799-3116

CODE	CIP TITLE	LEVEL
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019999	Agri. Bus. & Agric. Prod. Other	S
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0406 Northampton-Smith  
80 Locust  
Northampton, MA 01060

C. Bradley McGrath  
413-586-6970

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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010301	Agricultural Prod.	S	110201	Computer Programming	S
120403	Cosmetology	S	150303	Electronic Technology	S
170402	Community Health Work	S	170605	Practical Nursing	P
200401	Food Prod., Mgmt. & Serv.	S	460201	Carpentry	S
460501	Plumbing & Pipefitting	S	460302	Electrician	S
470604	Automotive Mechanics	S	470603	Automotive Body Repair	S
480503	Machine Tool/Machine Shop	S	480504	Metal Fabrication	S
480201	Graphic & Printing Commun.	S			

0408 Worcester Voc. Schools  
Wheaton Sq.  
Worcester, MA 01608

Robert K. Butler  
508-799-1940

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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061801	Small Business Mgmt.	S	110201	Computer Programming	P
110301	Data Processing	S	120403	Cosmetology	S
150101	Architec. Design & Construction	P	150302	Electronic Technology	P
150403	Electromechanical Technician	P	150403	Electromechanical Technology	P
170508	Physician Assisting	P	170101	Dental Assisting	P
			170508	Physician Assisting	P
			170602	Nursing Assisting	S



170605	Practical Nursing	P	170701	Ophthalmic Dispensing	P
200201	Child Care & Guid. Mgt. & Serv.	S	200301	Clothing Mgmt. Prod. & Serv.	S
200401	Food Prod., Mgmt. & Serv.	S	460201	Carpentry	S
460302	Electrician	S	460401	Bldg. & Prop Maint.	S
460501	Plumbing & Pipefitting	S	470201	Heating, A/C, Refrig. Mech.	P
470604	Automotive Mechanics	S	480101	Drafting, General	S
480101	Drafting, General	S	480203	Commercial Art	P
480201	Graphic & Printing Commun.	S	480503	Machine Tool/Machine Shop	S
460408	Painting & Decorating	S	480508	Welding	P
480506	Sheet Metal	S	480703	Millwork & Cabinetmaking	S
480508	Welding	S			

0618 Berkshire Hills Reg.  
Main St.  
Stockbridge, MA 01262

Joseph L. Wood  
413-298-3711

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
010601	Horticulture	S	150303	Electronic Technology	S
470604	Automotive Mechanics	S			

0650 Dighton-Rehoboth Reg.  
Horton  
North Dighton, MA 02764

Joseph C. Harrington  
508-252-4500

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	200201	Child Care & Guid. Mgt. & Serv.	S
460201	Carpentry	S	480101	Drafting, General	S
470604	Automotive Mechanics	S			
480503	Machine Tool/Machine Shop	S			

0658 Dudley-Charlton Reg.  
P.O. Box 97  
Dudley, MA 01570

John F. Canavan  
508-248-7334

CODE	CIP TITLE	LEVEL
080708	General Marketing	S

0665 Freetown-Lakeville Reg.  
(Apponequet)  
843 Bullock Rd.  
East Freetown, MA 02717

Michael J. Perrone  
508-763-5183

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
470604	Automotive Mechanics	S	480503	Machine Tool/Machine Shop	S

0672 Gateway Regional  
Littleville Rd.  
Huntington, MA 01050

Lawrence R. Holland  
413-667-3475

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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460201	Carpentry	S	480508	Welding	S
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0675 Hamilton-Wenham Reg.  
775 Bay Rd.  
South Hamilton, MA 01982

Patricia A. Alger  
508-468-4464

CODE	CIP TITLE	LEVEL
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080708	General Marketing	S
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0690 King Philip Reg.  
201 Franklin  
Wrentham, MA 02093

William J. Costa  
508-384-2174

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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080708	General Marketing	S	200401	Food Prod., Mgmt. & Serv.	S
460201	Carpentry	S	460302	Electrician	S
470604	Automotive Mechanics	S	480101	Drafting, General	S
480201	Graphic & Printing Commun.	S	480503	Machine Tool/Machine Shop	S
480506	Sheet Metal	S			

0700 Martha's Vineyard Reg.  
Box 639  
Vineyard Haven, MA 02568

Francis E. Pachico  
508-693-2007

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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010601	Horticulture	S	200401	Food Prod., Mgmt. & Serv.	S
460201	Carpentry	S	470604	Automotive Mechanics	S

0751 Plymouth-Carver Reg.  
11 Lincoln  
Plymouth, MA 02360

Renzo Riccuitti  
508-747-1620

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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080708	General Marketing	S	110201	Computer Programming	S
150303	Electronic Technology	S	200401	Food Prod., Mgmt. & Serv.	S
460201	Carpentry	S	460302	Electrician	S
470604	Automotive Mechanics	S	480201	Graphic & Printing Commun.	S

0760 Silver Lake Reg.  
130 Pembroke  
Kingston, MA 02364

Stephen Nestor  
508-585-4313

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
010201	Agric. Mechanics	S	080708	General Marketing	S
200401	Food Prod., Mgmt. & Serv.	S	460201	Carpentry	S
470603	Automotive Body Repair	S	470604	Automotive Mechanics	S
480506	Sheetmetal	S			

0767 Spencer E. Brookfield  
Main  
Spencer, MA 01562

Philip F. Devaux  
508-885-6331

CODE	CIP TITLE	LEVEL
080708	General Marketing	S

0770 Tantasqua Reg.  
Brookfield Rd.  
Sturbridge, MA 01566

Charles Pieterse  
508-347-3045

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
460201	Carpentry	S	460302	Electrician	S
480101	Drafting, General	S	480503	Machine Tool/Machine Shop	S
480508	Welding	S			

0775 Wachusett Reg.  
1128 Main St.  
Holden, MA 01520

Edward P. Yaglou  
508-829-6631

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
010301	Agricultural Prod.	S	480201	Graphic & Printing Commun.	S

0780 Whitman-Hanson Reg.  
Franklin  
Whitman, MA 02382

Louis P. Perullo  
617-447-0471

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	460201	Carpentry	S

0801 Assabet Valley Reg. Voc-Tech  
Fitchburg St.  
Marlborough, MA 01752

David J. Tobin  
508-485-9430



CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	110301	Data Processing	S
120403	Cosmetology	S	150303	Electronic Technology	S
170602	Nursing Assisting	S	170605	Practical Nursing	P
200401	Food Prod., Mgmt. & Serv.	S	460201	Carpentry	S
460302	Electrician	S	460401	Bldg. & Prop. Maint.	S
460408	Painting & Decorating	S	470106	Major Appliance Repair	S
470603	Automotive Body Repair	S	470604	Automotive Mechanics	S
480101	Drafting, General	S	480201	Graphic & Printing Commun.	S
480203	Commercial Art	S	480503	Machine Tool/Machine Shop	S
480506	Sheet Metal	S			

0805      Blackstone Valley Reg. Voc-Tech  
Pleasant St.  
Upton, MA 01568

Eugene D. Picard  
508-529-4593

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
110301	Data Processing	S	150303	Electronic Technology	S
170602	Nursing Assisting	s	200403	Chef/Cook	S
460201	Carpentry	S	460302	Electrician	S
460401	Bldg. & Prop. Maint.	S	460408	Painting & Decorating	S
460501	Plumbing & Pipefitting	S	470201	Heating, A/C,	S
470603	Automotive Body Repair	S		Refrig. Mech.	
470604	Automotive Mechanics	S	480101	Drafting	S
480201	Graphic & Printing Commun.	S	480503	Machine Tool/Machine Shop	S
480504	Metal Fabrication	S			

0806      Blue Hills Reg. Voc-Tech  
100 Randolph  
Canton, MA 02021

Wilfrid Savoie  
617-828-5800

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
110201	Computer Programming	S	150303	Electronic Technology	S
170602	Nursing Assisting	S	200401	Food Prod., Mgmt. & Serv.	S
460201	Carpentry	S	460302	Electrician	S
470201	Heating, A/C,	S	470603	Automotive Body Repair	S
	Refrig. Mech.				
470604	Automotive Mechanics	S	480101	Drafting, General	S
480201	Graphic & Printing Commun.	S	480203	Commerical Art	S
480503	Machine Tool/Machine Shop	S	480504	Metal Fabrication	S

0810      Bristol-Plymouth Reg. Voc-Tech  
940 County  
Taunton, MA 02780

Daniel J. Saunders  
508-823-5151

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
150303	Electronic Tech.	S	170402	Community Health Work	S
170605	Practical Nursing	S	200401	Food Prod., Mgmt. & Ser.	S
460201	Carpentry	S	460302	Electrician	S
460401	Bldg. & Prop. Maint.	S	460408	Painting & Decorating	S
470603	Automotive Body Repair	S	470604	Automotive Mechanics	S
480101	Drafting, General	S	480201	Graphic & Printing Commun.	S
480203	Commercial Art	S	480503	Machine Tool/Machine Shop	S
480506	Sheet Metal	S			

0815 Cape Cod Reg. Voc-Tech  
Pleasant Lake Ave.  
Harwich, MA 02645

Wilfred H. Learned, Jr.  
508-432-4500

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
010601	Horticulture	S	080708	General Marketing	S
120403	Cosmetology	S	150303	Electronic Tech.	S
170402	Community Health Work	S	200201	Child Care & Guid.	S
200301	Clothing Mgmt., Prod. & Serv.	S	200401	Food Prod., Mgmt. & Serv.	S
460102	Brick, Block & Stone Masonry	S	460201	Carpentry	S
460408	Painting & Decorating	S	460302	Electrician	S
470201	Heating, A/C,	S	460501	Plumbing & Pipefitting	S
470604	Automotive Mechanics	S	470603	Automotive Body Repair	S
480201	Graphic & Printing Commun.	S		Refrig. Mech.	
490306	Marine Maintenance	S	480506	Sheet Metal	S

0818 Franklin County Reg. Voc-Tech  
Industrial Blvd.  
Turners Falls, MA 01376

David Filkens  
413-774-2066

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
010601	Horticulture	S	110301	Data Processing	S
120403	Cosmetology	S	150303	Electronic Tech.	S
170402	Community Health Work	S	200401	Food Prod., Mgmt. & Serv.	S
460201	Carpentry	S	460302	Electrician	S
460401	Bldg. & Prop. Maint.	S	460501	Plumbing & Pipefitting	S
470603	Automotive Body Repair	S	470604	Automotive Mechanics	S
480101	Drafting, General	S	480201	Graphic & Printing Commun.	S
480503	Machine Tool/Machine Shop	S	480504	Metal Fabrication	S

0821 Greater Fall River Reg. Voc-Tech  
Stonehaven Rd.  
Fall River, MA 02723

Thomas J. McGarr  
508-678-2891

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
150303	Electronic Tech.	S	170101	Dental Assisting	P
170508	Physician Assisting	P	170605	Practical Nursing	P
200401	Food Prod., Mgmt. & Services	S	460201	Carpentry	S
460408	Painting & Decorating	S	460302	Electrician	S
470603	Automotive Body Repair	S	460501	Plumbing & Pipefitting	S
480101	Drafting, General	S	470604	Automotive Mechanics	S
480503	Machine Tool/Machine Shop	S	480201	Graphic & Printing Commun.	S
			480504	Metal Fabrication	S

0823 Greater Lawrence Reg. Voc-Tech  
57 River Rd.  
Andover, MA 01810

Louis E. Gleason  
508-686-0194

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	110201	Computer Programming	S
120403	Cosmetology	S	150303	Electronic Tech.	S
200201	Child Care & Guid Mgt. & Ser.	S	200301	Clothing Mgmt., Prod. & Serv.	S
200401	Food Prod., Mgmt. & Serv.	S	200601	Instit., Home Mgt. & Serv.	S
460201	Carpentry	S	460302	Electrician	S
460401	Bldg. & Prop. Maint.	S	460408	Painting & Decorating	S
460501	Plumbing & Pipefitting	S	470106	Major Appliance Repair	S
470199	Electronic Equip. Repair, Other	S	470201	Heating, A/C., Refrig. Mech.	S
470302	Heavy Equip. Maint. & Repair	S	470603	Automotive Body Repair	S
470606	Small Engine Repair	S	470604	Automotive Mechanics	S
480203	Commercial Art	S	480101	Drafting, General	S
480503	Machine Tool/Machine Shop	S	480303	Upholstering	S
			480504	Metal Fabrication	S

0825 Greater New Bedford Reg. Voc-Tech  
1121 Ashley Blvd.  
New Bedford, MA 02746

Jeffrey E. Riley  
508-998-3321

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
110201	Computer Programming	S	120403	Cosmetology	S
150303	Electronic Tech.	S	170402	Community Health Work	S
170503	Medical Assisting	S	200201	Child Care & Guid Mgt. & Serv.	S
200301	Clothing Mgmt. Prod. & Serv.	S	200401	Food Prod., Mgmt. & Serv.	S
200601	Instit., Home Mgt. & Serv.	S	460201	Carpentry	S
460302	Electrician	S	460408	Painting & Decorating	S
460501	Plumbing & Pipefitting	S	470106	Major Appliance Repair	S
470201	Heating, A/C, Refrig. Mech.	S	470501	Stationary Energy Sources	S
			470603	Automotive Body Repair	S



470604	Automotive Mechanics	S	480201	Graphic & Printing Commun.	S
480203	Commercial Art	S	480503	Machine Tool/Machine Shop	S
480504	Metal Fabrication	S	480102	Architectural Drafting	S
490306	Marine Maintenance	S	480105	Mechanical Drafting	S

0828      Greater Lowell Reg. Voc-Tech  
Pawtucket Blvd.  
Tyngsborough, MA 01879

William J. Collins  
508-454-5411

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
060701	Hotel/Motel Mgmt.	S	080708	General Marketing	S
110201	Computer Programming	S	110401	Info. Sciences/Systems	S
120403	Cosmetology	S	150303	Electronic Tech.	S
170602	Nursing Assisting	S	170605	Practical Nursing	P
200201	Child Care & Guid.	S	200301	Clothing Mgmt. Prod. & Serv.	S
200403	Chef/Cook	S	200601	Instit., Home Mgt. & Serv.	S
460102	Brick, Block & Stone Masonry	S	460201	Carpentry	S
460408	Painting & Decorating	S	460302	Electrician	S
470201	Heating, A/C, Refrig. Mech.	S	460501	Plumbing & Pipefitting	S
470606	Small Engine Repair	S	470603	Automotive Body Repair	S
480201	Graphic & Printing Commun.	S	470604	Automotive Mechanics	S
480303	Upholstering	S	480101	Drafting, General	S
480506	Sheet Metal	S	480203	Commercial Art	S
			480503	Machine Tool/Machine Shop	S
			480508	Welding	S

0829      S. Middlesex Reg. Voc-Tech (Keefe Tech.)  
750 Winter  
Framingham, MA 01701

Paul Bento  
508-879-5400

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
110301	Data Processing	S	120403	Cosmetology	S
150303	Electronic Tech.	S	200401	Food Prod., Mgmt. & Serv.	S
460201	Carpentry	S	460302	Electrician	S
470604	Automotive Mechanics	S	480101	Drafting, General	S
480201	Graphic & Printing Commun.	S	480203	Commercial Art	S
480504	Metal Fabrication	S			

0830      Minuteman Reg. Voc-Tech  
758 Marrett Rd.  
Lexington, MA 02173

Ronald J. Fitzgerald  
617-861-6500

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
010601	Horticulture	S	080708	General Marketing	S
110201	Computer Programming	S	120403	Cosmetology	S

150303	Electronic Tech.	S	150403	Electromechanical Tech.	S
170402	Community Health Work	S	200201	Child Care & Guid.	S
200401	Food Prod., Mgmt. & Serv.	S		Mgt. & Serv.	
460201	Carpentry	S	460302	Electrician	S
460408	Painting & Decorating	S	460501	Plumbing & Pipefitting	S
470201	Heating, A/C., Refrig.	S	470603	Automotive Body Repair	S
	Mech.		470604	Automotive Mechanics	S
480101	Drafting, General	S	480201	Graphic & Printing Commun.	S
480203	Commercial Art	S	480503	Machine Tool/Machine Shop	S
480508	Welding	S	480703	Millwork & Cabinetmaking	S

0832 Montachusett Reg. Voc-Tech  
1050 Westminster  
Fitchburg, MA 01420

Stratos Dukakis  
508-345-9200

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
110301	Data Processing	S	150303	Electronic Tech.	S
170101	Dental Assisting	S	170402	Community Health Work	S
170508	Physician Assisting	S	200401	Food Prod., Mgmt. & Serv.	S
460201	Carpentry	S	460302	Electrician	S
460401	Bldg. & Prop. Maint.	S	460501	Plumbing & Pipefitting	S
470603	Automotive Body Repair	S	470604	Automotive Mechanics	S
480101	Drafting, General	S	480208	Printing Press Occupation	S
480503	Machine Tool/Machine Shop	S	480508	Welding	S
480703	Millwork & Cabinetmaking	S			

0851 Northern Berkshire Reg. Voc-Tech  
Hodges Cross Rd.  
North Adams, MA 01247

Howard E. Brookner  
413-663-5383

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	110301	Data Processing	S
120403	Cosmetology	P	150303	Electronic Tech.	S
170101	Dental Assisting	P	170211	Surgical Technology	P
170508	Physician Assisting	P	170605	Practical Nursing	P
200401	Food Prod., Mgmt. & Serv.	S	460302	Electrician	S
460401	Bldg. & Prop. Maint.	S	470604	Automotive Mechanics	S
480503	Machine Tool/Machine Shop	S	480508	Welding	S

0852 Nashoba Valley Reg. Voc-Tech  
100 Littleton Rd.  
Westford, MA 01886

Bernholdt Nystrom  
508-692-4711

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
010601	Horticulture	S	110201	Computer Programming	S
150303	Electronic Tech.	S	170508	Physician Assisting	S

200401	Food Prod., Mgmt. & Serv.	S	460201	Carpentry	S
460302	Electrician	S	460408	Painting & Decorating	S
460501	Plumbing & Pipefitting	S	470603	Automotive Body Repair	S
470604	Automotive Mechanics	S	480101	Drafting, General	S
480201	Graphic & Printing Commun.	S	480303	Upholstering	S
480503	Machine Tool/Machine Shop	S	480506	Sheet Metal	S

0853 Northeast Metro Reg. Voc-Tech  
Hemlock Rd.  
Wakefield, MA 01880

Thomas F. Markham, Jr.  
617-246-0810

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
110201	Computer Programming	S	120403	Cosmetology	S
150303	Electronic Tech.	S	170402	Community Health Work	S
200401	Food Prod., Mgmt. & Serv.	S	460201	Carpentry	S
460302	Electrician	S	460501	Plumbing & Pipefitting	S
470603	Automotive Body Repair	S	470604	Automotive Mechanics	S
480101	Drafting, General	S	480201	Graphic & Printing Commun.	S
480203	Commercial Art	S	480503	Machine Tool/Machine Shop	S
480504	Metal Fabrication	S	480508	Welding	S
480703	Millwork & Cabinetmaking	S			

0854 North Shore Reg. Voc-Tech  
20 Balch  
Beverly, MA 01915

Patricia W. Carlson  
508-927-6178

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	110201	Computer Programming	S
120403	Cosmetology	S	150303	Electronic Tech.	S
200301	Clothing Mgmt. Prod. & Serv.	S	200401	Food Prod., Mgmt. & Serv.	S
460102	Brick, Block & Stone	S	460201	Carpentry	S
	Masonry		460401	Bldg. & Prop. Maint.	S
470106	Major Appliance Repair	S	470603	Automotive Body Repair	S
470604	Automotive Mechanics	S	470605	Diesel Engine Mechanics	S
480203	Commercial Art	S	480503	Machine Tool/Machine Shop	S
480508	Welding	S			

0855 Old Colony Reg. Voc-Tech  
476 North Ave.  
Rochester, MA 02770

John T. Oliveria  
508-763-8011

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
110201	Computer Programming	S	120403	Cosmetology	S
150303	Electronic Tech.	S	170402	Community Health Work	S
200401	Food Prod., Mgmt. & Serv.	S	460201	Carpentry	S
460302	Electrician	S	470604	Automotive Mechanics	S



480101 Drafting, General S  
 480503 Machine Tool/Machine Shop S  
  
 0860 Pathfinder Reg. Voc-Tech  
 Route 181  
 Palmer, MA 01069

480208 Printing Press Occupation S  
 480504 Metal Fabrication S  
  
 Gerald L. Paist  
 413-283-9840

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
010601	Horticulture	S	110201	Computer Programming	S
120403	Cosmetology	S	150303	Electronic Tech.	S
200401	Food Prod., Mgmt. & Serv.	S	460201	Carpentry	S
460302	Electrician	S	470604	Automotive Mechanics	S
480101	Drafting, General	S	480503	Machine Tool/Machine Shop	S

0871 Shawsheen Valley Reg. Voc-Tech.  
 100 Cook  
 Billerica, MA 01866

Charles Lyons  
 508-667-2111

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
110201	Computer Programming	S	110401	Info. Sciences/Systems	S
120403	Cosmetology	S	150303	Electronic Tech.	S
150601	Chemical Manufac. Tech.	S	170402	Community Health Work	S
200401	Food Prod., Mgmt. & Serv.	S	460102	Brick, Block, & Stone	S
460201	Carpentry	S		Masonry	
460302	Electrician	S	460401	Bldg. & Prop. Maint.	S
460501	Plumbing & Pipefitting	S	470201	Heating, A/C, Refrig. Mech.	S
470603	Automotive Body Repair	S	470604	Automotive Mechanics	S
470605	Diesel Engine Mechanics	S	480101	Drafting, General	S
480201	Graphic & Printing Commun.	S	480203	Commercial Art	S
480503	Machine Tool/Machine Shop	S	480506	Sheet Metal	S

0872 Southeastern Reg. Voc-Tech  
 250 Foundry  
 South Easton, MA 02375

Paul K. O'Leary  
 508-238-4374

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	110201	Computer Programming	P
120403	Cosmetology	S	150303	Electronic Tech.	P
150303	Electronic Tech.	S	170101	Dental Assisting	P
170309	Medical Lab Technology	P	170402	Community Health Work	S
170508	Physician Assisting	P	170605	Practical Nursing	P
200401	Food Prod., Mgmt. & Serv.	S	460102	Brick, Block, & Stone	S
460201	Carpentry	S		Masonry	
460302	Electrician	S	460401	Bldg. & Prop. Maint.	S
460408	Painting & Decorating	S	460501	Plumbing & Pipefitting	S
470106	Major Appliance Repair	S	470603	Automotive Body Repair	S

470604	Automotive Mechanics	S	470605	Diesel Engine Mechanics	S
470606	Small Engine Repair	S	480101	Drafting, General	S
480201	Graphic & Printing Commun.	S	480203	Commercial Art	S
480503	Machine Tool/Machine Shop	S	480504	Metal Fabrication	S
480703	Millwork & Cabinetmaking	S			

0873 South Shore Reg. Voc-Tech  
Webster St.  
Hanover, MA 02339

Clifford W. Easton  
617-878-8822

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	120403	Cosmetology	S
150303	Electronic Tech.	S	200401	Food Prod., Mgmt. & Serv.	S
460201	Carpentry	S	460302	Electrician	S
460408	Painting & Decorating	S	470201	Heating, A/C, Refrig. Mech.	S
470303	Indus. Mach. Maint. & Repair	S	470603	Automotive Body Repair	S
470604	Automotive Mechanics	S	480101	Drafting, General	S
480201	Graphic & Printing	S	480503	Machine Tool/Machine Shop	S
480504	Metal Fabrication	S	480508	Welding	S
490306	Marine Maintenance	S			

0876 S. Worcester County Reg. Voc-Tech (Bay Path)  
RR - 1 Box 277  
Charlton, MA 01507

George L. Fowler  
508-248-5971

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	110301	Data Processing	S
120403	Cosmetology	S	150303	Electronic Tech.	S
200301	Clothing Mgmt. Prod. & Serv.	S	200401	Food Prod., Mgmt. & Serv.	S
460302	Electrician	S	460201	Carpentry	S
460501	Plumbing & Pipefitting	S	460401	Bldg. & Prop. Maint.	S
470603	Automotive Body Repair	S	470201	Heating, A/C, Refrig. Mech.	S
470604	Automotive Mechanics	S	470606	Small Engine Repair	S
480101	Drafting, General	S	480202	Graphic & Printing Commun.	S
480503	Machine Tool/Machine Shop	S	480506	Sheet Metal	S
480703	Millwork & Cabinetmaking	S			

0878 Tri County Reg. Voc-Tech  
147 Pond St.  
Franklin, MA 02038

Jack Jones  
508-528-5400

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	120403	Cosmetology	S
150303	Electronic Tech.	S	200201	Child Care &	S

200401	Food Prod., Mgmt. & Serv.	S
460102	Brick, Block, & Stone	S
	Masonry	
460501	Plumbing & Pipefitting	S
470603	Automotive Body Repair	S
470604	Automotive Mechanics	S
480201	Graphic & Printing Commun.	S
480503	Machine Tool/Machine Shop	S
480703	Millwork & Cabinetmaking	S

0879 Upper Cape Cod Reg. Voc-Tech  
220 Sandwich Rd.  
Bourne, MA 02532

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
120403	Cosmetology	S	150303	Electronic Tech.	S
170402	Community Health Work	S	200401	Food Prod., Mgmt. & Serv.	S
460102	Brick, Block, & Stone	S	460201	Carpentry	S
	Masonry		460302	Electrician	S
460408	Painting & Decorating	S	460501	Plumbing & Pipefitting	S
470603	Automotive Body Repair	S	470604	Automotive Mechanics	S
480303	Upholstering	S	490306	Marine Maintenance	S

0885 Whittier Reg. Voc-Tech  
115 Amesbury Line Rd.  
Haverhill, MA 01830

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
080708	General Marketing	S	110201	Computer Programming	S
120403	Cosmetology	S	150303	Electronic Tech.	S
170402	Community Health Work	S	170508	Physician Assisting	P
170605	Practical Nursing	P	200301	Clothing Mgmt. Prod. & Serv.	S
200401	Food Prod., Mgmt. & Serv.	S			
460102	Brick, Block, & Stone	S	460201	Carpentry	S
	Masonry		460302	Electrician	S
460501	Plumbing & Pipefitting	S	470603	Automotive Body Repair	S
470604	Automotive Mechanics	S	470605	Diesel Engine Mechanics	S
480101	Drafting, General	S	480203	Commercial Art	S
480208	Printing Press Occ.	S	480503	Machine Tool/Machine Shop	S
480506	Sheet Metal	S	480508	Welding	S

0910 Bristol County Agr.  
Center  
Segregansett, MA 02773

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
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Guid. Mgt. & Serv.	
Electrician	S
Bldg. & Prop. Maint.	S
Heating, A/C,	S
Refrig. Mech.	
Drafting, General	S
Commercial Art	S
Metal Fabrication	S

David Sampson  
508-759-7711

Richard M. Kay  
508-373-4101

Roger H. Beaudoin  
508-669-6744



010201	Agric. Mechanics	S	010302	Animal Production	S
010304	Crop Production	S	010399	Poultry	S
010602	Arboriculture	S	010603	Ornamental Horticulture	S
010605	Lanscaping	S	019999	Agribus. & Agric. Prod.	S
				Other	

0913      Essex Agr. Tech.  
Maple  
Hathorne, MA 01937

Gustave D. Olson, Jr.  
508-774-0050

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
010302	Animal Production	S	010302	Animal Production	P
010402	Food Products	P	010504	Pet Grooming	P
010603	Ornamental Horticulture	S	010603	Ornmanetal Horticulture	P
010605	Lanscaping	S	010606	Nursery Oper. & Mgmt.	P
030401	Forestry Prod. & Process.	S	030601	Wildlife Management	P
039999	Renewable Nat. Res., Other	P	080101	Apparel & Accessories	P
120403	Cosmetology	P	170211	Surgical Technology	P
170508	Physician Assisting	P	170605	Practical Nursing	P
200402	Baking	P	200403	Chef/Cook	P

0915      Norfolk County Agr.  
460 Main  
Walpole, MA 02081

Richard C. Morse  
508-668-0268

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
010302	Animal Production	S	010398	Animal Science (Small)	S
010601	Horticulture	S	010602	Arboriculture	S
019999	Agribus. & Agric. Prod. Other	S			

1177      So. Berkshire Educ. Collab.  
Main St. Box 739  
Stockbridge, MA 01262

Richard G. Labrie  
413-528-2410

CODE	CIP TITLE	LEVEL	CODE	CIP TITLE	LEVEL
170402	Community Health Work	S	200401	Food Prod., Mgmt. & Serv.	S

1176 006















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